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AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 1888, 1899, 1920, 1923, 1925, 1963, 1971, 1973, 2013, 2097, 2104, 2106, 2127, 2161, 2170, 2178, 2190, 2217, 2219, 2220, 2221)

1583. ANONYMOUS. Springside crop-growing competition. Agric. Gaz. New South Wales 32: 86-87. 1921.—Results are given by 6 farmers in crop growing for prizes. Varieties, methods of cultivation, amounts of seed and manure, and other data are tabulated.—*L. R. Waldron.*

1584. ANONYMOUS. The trend of research work in the agricultural utilization of peat land. Jour. Amer. Peat Soc. 14: 64-66. 1921.—Most of the undrained peat land in the United States is strongly acidic. Raw peat soils are suited to the culture of millet, buckwheat, redtop, oats, corn, rye, potato, the blueberry, and the cranberry. When treated with potash salts and lime they are neutralized and should yield good crops of red clover, wheat, and rutabagas. The successful cultivation of peat lands is dependent on the recognition of differences of acidity and alkalinity and the appropriate adaptation of crops.—*G. B. Rigg.*

1585. ANONYMOUS. Verslagen der Rijkslandbouw proefstations voor Contrôle-Onderzoek. [Reports of the Government Agricultural Control Stations.] Verslag. en Mededeel. Directie Landb. [Nederland] 1919⁴: 1-103. 1919.—A report is given of the activities of the Control Agricultural Stations at Wageningen, Goes, and Maastricht on examinations of fertilizers, seed samples, etc.—*J. C. Th. Uphof.*

1586. ANONYMOUS. Verslagen der Rijkslandbouw proefstations voor Contrôle-Onderzoek. [Reports of the Government Agricultural Control Stations.] Verslag. en Mededeel. Directie Landb. [Nederland] 1920⁴: 1-80. 1920.—A report of the activities of the Control Agricultural Stations at Wageningen, Goes, and Maastricht on examinations of fertilizers, seed samples, etc.—*J. C. Th. Uphof.*

1587. ANONYMOUS. [Rev. of: BRENCHEY, W. E. Weeds of farm land. $x + 329$ p. Illus. Longmans, Green & Co.: London, 1920.] Sci. Prog. [London] 15: 500-501. 1921.

1588. ANONYMOUS. Habit in sugar canes. [Rev. of: RAO, N. VITTAL. Habit in sugar canes. Agric. Jour. India 15: 418-424. 1920. (Paper read at the 7th Indian Science Congress, Nagpur, 1920.) (See Bot. Absts. 7, Entry 1569).] Internat. Sugar Jour. 23: 109. 1921.

1589. ANNETT, HAROLD EDWARD. Factors influencing alkaloidal content and yield of latex in the opium poppy (*Papaver somniferum*). *Biochem. Jour.* 14: 618-636. 1920.—The following points are discussed by the writer: (a) Alkaloidal content and yield of latex from each of a series of successive lancements of the same capsule; (b) variation in rate of flow and morphine content of latex at different periods of time after incision; (c) effects of different systems of lancing on yield and composition of latex; (d) yield and alkaloidal content of latex from different capsules on the same plant; (e) relation between stage of development of capsule and yield, and alkaloidal content of latex; (f) effects of climate and weather conditions; (g) influence of manures; (h) influence of starvation; and (i) influence of heredity.—A. R. Davis.

1590. B[ARBER], C. A. On the viability of sugar cane pollen. *Internat. Sugar. Jour.* 23: 71-72. 1921.—T. S. VENKATARAMAN of the Coimbatore Cane-breeding Station in south India reports success in germinating sugar cane pollen. The stigmas of *Datura fastuosa* var. *alba* and *Hibiscus vitifolia* germinated cane pollen satisfactorily. Working with this test it was found that cane pollen usually lost its viability in less than an hour, varying slightly with the variety of cane. By protecting a cane plant with its arrows, the pollen sacs were prevented from bursting. In this way pollen was kept viable for 6-14 days.—C. Rumbold.

1591. BESEMFELDER, R. Der Zuckerrübenbau der Zukunft. [The sugar beet culture of the future.] *Mitteil. Deutsch. Landw. Ges.* 35: 401-406. 1920.—A general review of the factors affecting the growth of the sugar beet industry.—A. J. Pieters.

1592. BOUSSET, HERMANN. Das Schilfrohr als Wirtschaftspflanze und das Siedlungsproblem. [Phragmites as an economic plant and the settlement problem.] *Mitteil. Deutsch. Landw. Ges.* 35: 411-413. 1920.—There are 200,000 hectares of low land on sea and river in Germany covered with *Phragmites*. The growth tends to encroach on the water and obstruct navigation. To combat this, machines have been constructed with clam shell buckets to dredge out the mass of rootstocks. It is said that the rootstocks contain 52 per cent extractives, of which 30 per cent is sugar. The rootstocks have been used to prepare alcohol, 100 kg. of air dry material yielding 11 liters of 100 per cent alcohol. A heavy beer, resembling porter, has also been brewed, and from some parts of the rootstocks a cocoa-like drink called "Branca" can be made. A feed for cattle called "Fragruit" is also produced and is said to have a high feeding and digestive value.—A. J. Pieters.

1593. DAWE, M. T. Colombian pita fibre.—Part I. *Tropic. Life* 16: 182-183. 1920.—The Pita plant, *Ananas* sp. is found in Colombia and adjacent South and Central American republics. It has been known as *Ananas macrodontes* but a recent examination of material at the Kew Gardens "proves the Colombian plant to be quite distinct from this species." A single plant 10 feet or more in length and 4 inches broad in the middle bears from 20 to 40 leaves, and produces a pineapple-like fruit. Propagation is usually by rootstocks; the plant makes its best growth in the shade. The Chiriguana forest of Colombia is famed for its "pitales." It does best on a light sandy, well-drained soil. The fiber of the Pita plant is long and strong and would be classed commercially as a hard fiber, and could be used as a substitute for sisal, abaca (Manila hemp), and other hard fibers.—H. N. Vinall.

1594. EGGINTON, G. E., AND W. W. ROBBINS. Irrigation water as a factor in the dissemination of weed seed. *Colorado Agric. Exp. Sta. Bull.* 253. 25 p. 1920.—Weed traps of wire netting were placed in irrigation ditches and at the end of varying periods their contents were removed, dried, and examined. In 156 traps from 3 different ditches 81 species of weed seeds were found. The factors influencing the number of seeds carried are enumerated and explained: (1) Flora of ditch bank and adjacent territory; (2) season of year; (3) direction and velocity of wind; (4) velocity of water and character of water surface. Continued grazing is recommended as the most effective and most economical method in reducing weed growth. The seeding of ditch banks to brome grass is also suggested.—Elsa B. Eisendrath.

1595. FLYNN, H. C. K. Statistics of crops grown by Europeans in southern Rhodesia for the season 1919-1920. Rhodesia Agric. Jour. 18: 9-16. 1921.—General crop statistics for 1919-1920, compiled from reports sent in by farmers for that period. Figures are given for maize, wheat, ground nuts, beans, kafir corn, sunflowers, buckwheat, cattle melons, pumpkins, rice, Rapola, potatoes, teff grass, oat hay, Napier grass, millet, veld hay, tobacco, and citrus orchards.—*Mary R. Burr.*

1596. FRAPS, G. S. Feeding values of certain feeding stuffs. Texas Agric. Exp. Sta. Bull. 245. 29 p. 1919.—Digestible matter and productive value of foods may be very different. Tests were made with cottonseed meal and cottonseed hulls, showing that the former has almost twice the digestible material but about four times the productive value of the latter. Compositions and feeding values are given for acorns, alfalfa hay, bear grass, beet pulp, corn cobs, cotton burs, cottonseed, peanut meal, prairie hay, rice bran, rice hulls, Rhodes grass hay, soapweed, and Spanish moss.—*L. Pace.*

1597. FRAPS, G. S., AND S. LOMANITZS. The salt or sodium chloride content of feeds. Texas Agric. Exp. Sta. Bull. 271. 14 p. 1920.—A rapid method of estimating chlorides is described, and the chloride content of a number of feeds is given. Eastern alfalfa is lower in chlorides than western. The question as to whether the chlorides in alfalfa are useful, and whether an addition of salt to some alfalfa soils would be beneficial cannot yet be answered.—*L. Pace.*

1598. HARRIS, F. S. The agronomist's part in the world's food supply. Science 52: 395-400. 1920.—The author, looking into the future, finds the problem of feeding an ever-increasing population a more and more difficult one. An increased production will be called for, which can be realized in 2 ways: 1st, by extending the producing area; 2nd, by increasing the acre yield of the present cultivated area. The methods for enlarging the agricultural area are discussed under the following headings: Increasing the irrigated area; extending dry farming; draining the wet lands; and reclaiming the alkali lands.—*A. H. Chivers.*

1599. HOEK, P. VAN. Verslag over den Landbouw in Nederland. [Report on Agriculture in the Netherlands.] Verslag. en Mededeel. Directie Landb. 1920³: 1-116. 1920.—Reports are given on production and condition of farm crops, vegetables, fruits, seeds, bulbs; other agricultural and horticultural activities in the Netherlands are likewise considered.—*J. C. Th. Uphof.*

1600. HOFFMAN. Kartoffeldüngungsversuche mit Kalisulfaten im Erntejahr 1920. [Potato fertilizing experiments with potassium sulphate in the season 1920.] Mitteil. Deutsch. Landw. Ges. 36: 116. 1921.—Potassium sulphate was compared with a potassium-magnesium sulphate; no additional advantage resulted from the use of the latter.—*A. J. Pieters.*

1601. LEIPZIGER. Bericht über einige Gras- und Kleebau-betriebe Norddeutschlands. [Report on some grass and clover seed operations of north Germany.] Mitteil. Deutsch. Landw. Ges. 36: 134-135. 1921.—An account of a visit to several farms where grass and clover seeds are grown as special crops. Selection of color for winter hardiness was being carried on near Niendorf.—*A. J. Pieters.*

1602. LEPPAN, H. D. The production of foodstuffs for live stock in South Africa. South African Jour. Indust. 3: 1116-1130. 1920.—Agronomic production is related to rainfall, soils, altitudes, and latitude, and the author discusses these factors for South Africa. The acre yields of most crops are low, the average for maize being 7-10 bushels; the causes of the low yields are said to be generally careless methods of farming and attempts to grow unsuitable crops. Feed stuffs to supplement grazing are greatly needed and the making of silage is urged. The author lists and discusses the chief summer and winter forage crops, noting that "the cultivated grasses of promise in South Africa to-day are all indigenous to Africa, chiefly tropical Africa." The most important summer forage crops are maize, lucerne, Teff grass (*Eragrostis Abyssinica*), millets (*Chaetocloa*, *Echinochloa*, *Pennisetum*), cowpeas, soybeans,

and sorghums. Besides Teff grass, Sudan, Kikuyu (*Pennisetum longistylum*), Toowoomba grass (*Phalaris bulbosa*), and Napier or Elephant grass (*Pennisetum purpureum*) do quite well. Among the most important of what may be called the minor agricultural grasses in South Africa are *Paspalum dilatatum* (Water grass), *Paspalum virgatum* (Erect Paspalum), *Festuca arundinacea* (New Zealand tall Fescue), *Festuca ovina* (Italian Fescue), *Dactylis glomerata* (Cocksfoot), *Lolium mutiflorum* (Italian rye grass), and *Chloris gayana* (Rhodes grass). Blaauwzaad grass (*Chloris virgata*) has done well in parts of the Orange Free State and in the Transvaal. Root crops are grown under irrigation, and Kaffir melons, pumpkins, ground nuts, artichokes, sunflowers, and velvet beans are grown to some extent. Tepary beans, Kudzu, and Mung beans have recently been introduced and seem worthy of attention. The chief winter crops are the grains, rape, vetches, and peas.—A. J. Pieters.

1603. McDONALD, A. H. E. Cutting Sudan grass for seed. Agric. Gaz. New South Wales 32:85. 1921.—In New South Wales best results are secured when the 2nd or 3rd growths are cut for seed. Binders are used for harvesting.—L. R. Waldron.

1604. MAIDEN, J. H. Chats about the prickly pear. No. 9. Agric. Gaz. New South Wales 32: 97-104. 4 fig. 1921.—The author discusses *Opuntia aurantiaca*, *O. elatior*, *O. inermis*, *O. tomentosa*, *O. ficus-indica*, *O. robusta*, *O. monacantha*, *O. Dillenii*, and *O. cochinillifera* as noxious weeds. Distribution, taxonomy, and morphological characters of the species are considered.—L. R. Waldron.

1605. MUNDY, H. G. Kudzu vine. (*Pueraria thunbergiana*). Rhodesia Agric. Jour. 18: 83-88. Fig. 1-2. 1921.—Kudzu, an extremely promising legume, has been grown at the Salisbury experiment station since 1918. It makes an early spring growth, and gives a heavy yield of nutritious fodder, apparently palatable either green or dry for all classes of stock. Kudzu produces root nodules freely and leaves a large amount of decaying vegetable matter on the land; consequently, it should be valuable as a soil renovator.—Mary R. Burr.

1606. MUNDY, H. G. Wheat in Rhodesia. Rhodesia Agric. Jour. 17: 501-512. 6 fig. 1920.—The present annual consumption of wheat in southern Rhodesia is some 31,000 bags in excess of production. The paper discusses cultural methods for wheat growing, varieties, harvesting and threshing, and diseases and pests. Summer wheat cannot be grown because of rust; winter wheat may sometimes suffer from rust, but not seriously. Some work has been done in selection of resistant varieties but so far with no permanent success. Smut is prevalent and seed treatment is urged. Deaf ear or white ear is caused by frost at blossoming time. This can be prevented by seeding at such a time that the plant does not bloom until after frost or by grazing to retard the maturity of the plant.—A. J. Pieters.

1607. NOLTE, O. Düngungsversuche mit magnesiahaltigen und magnesiafreien Kalisalzen. [Fertilizer experiments with magnesia-free and magnesia-containing potash salts.] Mitteil. Deutsch. Landw. Ges. 36: 136. 1921.—Both potassium-magnesium sulphate and potassium chloride failed to increase the yield of potatoes in this experiment, although on the same field, but in another experiment, potassium sulphate produced a large increase in yield.—A. J. Pieters.

1608. Παπαγεωργίου Πηλ. Συμβολή Εἰς Τὴν Ἑλληνικὴν Σιτηρογραφίαν. [PAPAGEORGIOU, PELEUS. Contribution to Greek cereology. Part 1, wheat.] 139 p. Athens, 1919.—A short treatise, or monograph, dealing with the cultivated kinds of wheat in all of the different parts of Greece, with a brief introduction on selection, breeding, the cereology of ancient Greece, and the importance of wheat cultivated in modern Greece. The native varieties especially adapted to the climatic conditions of Greece are examined and information as to yield, time of sowing, soil and rainfall requirements are fully discussed. The species of wheat, *Triticum polonicum*, *T. durum*, *T. turgidum*, *T. sativum*, *T. spelta*, *T. amyleum*, and *T. monococcum* are discussed and illustrated. A table of the main species of wheat with their most important varieties is included. A bibliography is also given.—Geo. Bouyoucos.

1609. PRIDHAM, J. T. The origin and history of Sunrise oats. *Agric. Gaz. New South Wales* 32: 88-90. 2 fig. 1921.—The variation was noticed in 1910 and probably arose from field cross between wild oats (*A. fatua*) and Algerian oats (*A. sterilis*). The variety is early and the seed creamy white. Two variations of Sunrise have been named Cowra No. 25 and Cowra No. 27.—*L. R. Waldron*.

1610. PRIDHAM, J. T. Ortlipp's Bungownannah wheat. *Agric. Gaz. New South Wales* 32: 85. 1921.—This variety is the same as Turvey or Turvey's Purple Straw and belongs to the Tuscan group of wheats.—*L. R. Waldron*.

1611. REINECKE, T. G. W. Results of winter cereal experiments at the School of Agriculture, Elsenburg, Mulder's Vlei, Cape Province. *Jour. Dept. Agric. Union of South Africa* 1: 45-54. 1920.—Considering both palatability of hay and yield per acre, combination of the various varieties of oats and vetches have been found the best for hay. For ensilage a mixture of Smyrna oats and spring or French winter vetch can be recommended in addition to hairy vetch and Algerian oats. Rye, barley, wheat, and field peas have not been found desirable crops for hay mixtures.—*E. M. Doidge*.

1612. RINDL, M. Sesame and melon seeds sources of semi-drying oils. *South African Jour. Indust.* 3: 1150-1154. 1920.—The author treats of the production and consumption of the seeds of sesame, its varieties, utilization, cultivation, harvesting, pressing, production in Africa, and prices. The fat content of both fresh and dried melon seeds is given.—*Mary R. Burr*.

1613. SCHERFFIUS, W. H. Cotton culture. Practical advice for the South African grower. *Jour. Dept. Agric. Union of South Africa* 2: 160-162. 1921.—General cultural notes emphasizing the importance of using pure seed and having quality as the principal aim in cotton production.—*Mary R. Burr*.

1614. SCHMID, A. Bericht der Zentralverwaltung der schweizerischen landwirtschaftlichen Versuchs- und Untersuchungsanstalten über die Versuchstätigkeit in den Jahren 1913-1919. [Report of experimental work performed during 1913-1919.] *Landw. Jahrb. Schweiz* 1919: 513-518. 1919.—A brief résumé of field experiments conducted by the Swiss government, including observations on cultural tests with grains, beets, and potatoes; studies of the behavior of various mixtures of grass seeds and of pasture fertilizing; and experiments on the control of diseases and other pests of cultivated plants.—*J. D. Luckett*.

1615. STAFFELD, U. Aussaatstärke unter Berücksichtigung des Tausendkorngewichts. [Rate of seeding in relation to the weight of 1000 grains.] *Mitteil. Deutsch. Landw. Ges.* 35: 408-411. 1920.—A discussion of the relations between the weights of 1000 grains of oats, winter rye, summer and winter wheat, the rate of seeding, and probable yields.—*A. J. Pieters*.

1616. TAYLOR, H. W. Cotton culture. *Rhodesia Agric. Jour.* 17: 436-440. 1920.—Author gives the figures for world cotton production for a period of 20 years (1894-1914). During this period the production of cotton in the United States increased 53.2 per cent and the price per pound 90.4 per cent. America supplies 85 per cent of the cotton used in Great Britain. In southern Rhodesia soil and climatic conditions are favorable for cotton production. General cultural notes are given; also figures showing the value of the crop. The developments of new cotton areas and the stimulation of the industry in Great Britain is urged.—*Mary R. Burr*.

1617. TAYLOR, H. W. Turkish tobacco. *Rhodesia Agric. Jour.* 17: 513-521. Fig. 1-7. 1920.—Turkish tobacco is grown in Rhodesia by a number of planters with varying degrees of success. The crop is easy to grow, but the harvesting and handling require considerable skill which can be acquired only by actual experience. The article gives detailed directions for culture, harvesting, curing, grading, and packing.—*C. V. Piper*.

1618. VOLKART, A., A. GRISCH, UND W. BANDI. Vierzigster und einundvierzigster Jahresbericht der Schweiz. Samenuntersuchungs- und Versuchsanstalt Oerlikon-Zurich.

[Fortieth and forty-first annual reports of the Swiss seed testing station at Oerlikon-Zurich,] Landw. Jahrb. Schweiz 1919: 38-77. 1919.—The reports include: (1) A report of the seed testing station for the years 1916-17 and 1917-18, with a summarized statement of the results of seed tests from 1876 to 1918; (2) a brief review of cultural tests with field crops conducted by the station 1917-18; and (3) a report of work on the control of plant diseases and of weeds during 1917 and 1918.—*J. D. Lockett.*

1619. VOSZ, G. Vergleichende Versuche zur Bekämpfung von Hederich und Ackersenf mit chemischen Mitteln. [Comparative tests of chemicals for the control of hedge-mustard and charlock.] Fühling's Landw. Zeitg. 69: 226-234. 1920.—Results of experiments with kainit, $\text{Ca}(\text{NO}_3)_2$, a mixture of kainit and $\text{Ca}(\text{NO}_3)_2$ in half the full amounts, FeSO_4 and $(\text{NH}_4)_2\text{SO}_4$ for killing hedge-mustard (*Raphanus raphanistrum*) and charlock (*Sinapis arvensis*) in fields of oats. The first 3 materials were dusted on the plants in powdered form early in the morning while the plants were heavily covered with dew, at the following rates per hectare: Kainit, 1000 kgr.; $\text{Ca}(\text{NO}_3)_2$, 140 kgr.; mixture of 500 kgr. kainit and 70 kgr. $\text{Ca}(\text{NO}_3)_2$. The FeSO_4 and $(\text{NH}_4)_2\text{SO}_4$ were applied at the rate of 150 kgr. per hectare in 25 per cent solutions sprayed on the plants just before noon.—The most satisfactory results in all cases were secured with $(\text{NH}_4)_2\text{SO}_4$ solution. In addition to killing the mustard, the solution showed a marked fertilizer effect in increasing the yields of oats. The other materials also gave satisfactory results except that in one case FeSO_4 solution partly damaged the oats, causing a somewhat reduced yield. Next to $(\text{NH}_4)_2\text{SO}_4$, $\text{Ca}(\text{NO}_3)_2$ produced the greatest increases in yield of oats. To get satisfactory results with the powdered chemicals there should be a heavy dew, which should not evaporate too quickly.—*A. T. Wiancko.*

1620. WALSTER, H. L. Which variety for North Dakota? [Part of: "Practical pointers on North Dakota farming."] North Dakota Agric. Exp. Sta. Ext. Div. Circ. 40. 3-8. 1920.—The author recommends varieties of spring wheat, oats, barley, corn, flax, potatoes, sunflowers for silage, hay and pasture crops best adapted to North Dakota conditions.—*L. R. Waldron.*

1621. WALTERS, J. A. T. Fibre crops. Deccan hemp (*Hibiscus cannabinus*) and Sunn hemp (*Crotalaria juncea*). Rhodesia Agric. Jour. 17: 522-528. Fig. 1-4. 1920.—Experimentation has demonstrated the fact that both Deccan hemp and Sunn hemp seem to thrive on the common red and granite soils of Rhodesia under conditions suitable for maize. Both plants are sources of valuable commercial fiber. The adaptability of the 2 crops to Rhodesian conditions makes them highly desirable as constituents in a system of rotation with maize or tobacco.—*Mary R. Burr.*

1622. WHITTET, J. N. Farmers' experiment plots. Grasses and clovers for the North coast. Agric. Gaz. New South Wales 32: 135. 1921.—Rhodes grass (*Chloris gayana*), elephant grass (*Pennisetum purpureum*), canary grass (*Phalaris bulbosa*), Chilean clover (*Trifolium pratense perenne*), and Bokhara clover (*Melilotus alba*) were planted on a private farm for comparative trial. No results are given.—*L. R. Waldron.*

1623. WHITTET, J. N. The production of lucerne seed. With some reference to lucerne culture in our drier districts. Agric. Gaz. New South Wales 32: 105-112. 16 fig. 1921.—Alfalfa trials are under way at Bathurst and Cowra experiment farms and include varieties and geographic strains as follows: Tamworth Broad Leaf, China, Cossack, Semipalatinsk, Montana, Kansas, Bathurst Nos. 6 and 9, and Grimm. The author discusses pollination and the need for testing for purity and vitality. Results of purity test are given; also information for seeding, harvesting, and threshing the crop.—*L. R. Waldron.*

1624. WILLIAMS, C. O. Composition and valuation of fertilizers and feeding stuffs. Jour. Dept. Agric. Union of South Africa 1: 368-382. 1920.—This is a critical account of the various fertilizers and feeding stuffs at present on the South African market.—*E. M. Doidge.*

1625. WINTERS, R. Y., AND V. R. HERMAN. Soybeans for the Piedmont and mountain sections of North Carolina. North Carolina Agric. Ext. Service Ext. Circ. 111. 15 p. 1921.—An agronomic study of the comparative value of soybeans and cowpeas for seed and hay.—*F. A. Wolf.*

BIBLIOGRAPHY, BIOGRAPHY AND HISTORY

NEIL E. STEVENS, *Editor*

(See also in this issue Entries 1608, 1819, 1822, 1837, 1858, 1863, 2020, 2066, 2101)

1626. ANONYMOUS. A journal of ecology. *Science* 51: 161. 1920.—The Plant World has been transferred to the Ecological Society of America, and will be continued as the official organ of that society, under the title of *Ecology*.—*Neil E. Stevens*.

1627. ANONYMOUS. An unsere Leser. [To our readers.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 174. 1920.—Announcement under date of July 2, 1920, of the addition of the word "Wiener" (Vienna) to the title of the journal in order to distinguish it from the German periodical of the same name (*Allgemeine Forst- und Jagd-Zeitung*), under which it was issued from March 5 to June 25, 1920 (v. 38, no. 10-26), having been previously published under the title: *Oesterreichische Forst- und Jagd-Zeitung*.—*F. S. Baker*.

1628. ANONYMOUS. The botanical survey of the Union of South Africa. *Jour. Dept. Agric. South Africa* 1: 180-182. 1920.—See *Bot. Absts.* 8, Entry 1629.

1629. ANONYMOUS. Botanical survey of the Union of South Africa. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1919: 399-403. 1919.—The Advisory Committee was announced Oct. 5, 1918, with Dr. I. B. POLE-EVANS as head and acting director of the survey. Miss A. G. CORBISHLEY was appointed Oct. 15, 1919, as botanical assistant at Kew on work connected with the survey. The scope of the survey is outlined.—*M. F. Warner*.

1630. ANONYMOUS. Edward John Woodhouse. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 32. 1918.—Lieut. E. J. Woodhouse, Economic Botanist and Principal of the Agricultural College of Bihar and Orissa, died in France December 18, 1917, at the age of 33.—*M. F. Warner*.

1631. ANONYMOUS. John Gilbert Baker. *Gard. Chron.* III, 68: 102. 1920.—Brief sketch of the life and work of J. G. Baker (1834-1920).—*M. F. Warner*.

1632. ANONYMOUS. Major S. M. Toppin's bequest to the Royal botanic gardens. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 156-157. 1918.—Important collections made on northwestern frontier of India and in northern Burma, by Sidney Miles Toppin, born June 12, 1878, and killed near Ypres, Sept. 24, 1917.—*Neil E. Stevens*.

1633. ANONYMOUS. Maurice L. de Vilmorin. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 190. 1918.—Obituary of M. L. de Vilmorin (1849-1918), senior member of the firm of Vilmorin-Andrieux & Cie., who was specially interested in the introduction of Chinese plants, and who had at his estate of Les Barres a collection of shrubs which was probably the most comprehensive in Europe.—*M. F. Warner*.

1634. ANONYMOUS. Polozheniye opytnogo otdela v sisteme organov Komissariata Zemledeliya. [The status of the experimental division in the system of organization of the commissariat of agriculture.] *Vestnik Narodnogo Kom. Zeml.* 1: 55-59. 1919.—An independent division of the Russian Commissariat of Agriculture, designated as the Experimental Division, has been created in the system of the present government of Russia, with the task of uniting, promoting, and directing agricultural experimental work. A higher degree of efficiency and greater coordination of activities in agricultural research is expected through this consolidation. The new office covers climatological, geobotanical, and soil investigations; administrative and financial direction of experiment stations, botanical gardens, and like institutions; meteorology; horticulture; fiber plants; tea; tobacco; oil plants; mineral fertilizers; breeding and selection; agricultural engineering; entomology and phytopathology. The Experimental Division undertakes also to prepare specialists in various lines of agricultural experimentation and to popularize the results of scientific achievements. The Division expects to work in consultation with an advisory board of representatives of various experimental institutions.—*Michael Shapovalov*.

1635. ANONYMOUS. Presentation of the Capt. Scott memorial medal to Dr. I. B. Pole Evans, on May 15th, 1919. *South African Jour. Nat. Hist.* 2: 12-18. *Pl.* 1. 1920.—A note on the scientific training and work of Iltyd Buller Pole Evans, with special reference to his services in organizing phytopathological work in the Transvaal, and a list of his publications.—*M. F. Warner.*

1636. ANONYMOUS. Reginald J. Farrer. *Nature* 106: 413-414. 1920.—Life and work of Reginald John Farrer (1880-1920), collector and cultivator of alpine plants, as well as author of books of fiction and on rock gardens. He received the Gill memorial medal of the Royal Geographical Society in 1920 for work on the Chinese border of Tibet.—*O. A. Stevens.*

1637. ANONYMOUS. R. H. Pearson. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 213. 1918.—Obituary notice of Robert Hooper Pearson (1866-1918), connected since 1892 with the *Gardeners' Chronicle*, and for the past 10 years its managing editor.—*M. F. Warner.*

1638. ANONYMOUS. Samuel Mills Tracy. *Science* 52: 270. 1920.—Died at Laurel, Mississippi, September 5th, 1920, aged 73 years.—*M. F. Warner.*

1639. ANONYMOUS. [Sir Edmund Loder.] *Bull. Soc. Nat. Acclim. France* 67: 97-99. 1920.—Obituary notice. Loder was better known as a zoologist, though he was also noted for his special knowledge of rhododendrons and conifers, publishing in 1913 a list of his magnificent collection of conifers at Leonardslee.—*M. F. Warner.*

1640. ANONYMOUS. T. A. Dorrien-Smith. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 242-243. 1918.—Obituary of Thomas Algernon Dorrien-Smith, who died on August 6th, 1918, in his 73d year. His gardens at Tresco Abbey in the Scilly Islands were especially remarkable for the New Zealand and Australian plants which flourished there. He was the pioneer in the culture of *Narcissus* on an extensive scale for the English markets, an industry begun about 35 years ago in a time of distress among the Scilly farmers.—*M. F. Warner.*

1641. ÅKERMAN, ÅKE. F. Kølpin Rayn, 10 maj 1873-25 maj 1920. *Sveriges Utsadesför. Tidskr.* 30: 122-124. 1920. [See also *Bot. Absts.* 8, Entries 1681, 1708, 1804.]

1642. ALKER, F. R. Botanical gleanings from the writings of early travellers in western Pennsylvania. *Trillia* 5: 8-22. 1919.—J. D. Schoepf, Thomas Hutchins, William Darby, F. Cumming, and Joseph Doddridge.—*Neil E. Stevens.*

1643. ARBER, A[RB]ER, A[GNES]. Edward Alexander Newell Arber (1870-1918). *Jour. Botany* 56: 305-308. *Portrait* (facing p. 337). 1918.—E. A. Newell Arber, one of the leading students of systematic paleobotany, was also an authority on plant life in the Alps. The present sketch includes notes on his education and personal characteristics. [See also *Bot. Absts.* 8, Entry 1772.]—*Neil E. Stevens.*

1644. ARDOUIN-DUMAZET. Les pêchers de Montreuil I-II. [Peach culture at Montreuil.] *Jour. Agric. Pratique N.S.*, 33: 126-128, 165-167. 1920.—The first part gives the beginnings of the peach culture which has given to this region the name of Montreuil-aux-Pêches. The first planting is said to have been done by Girardot, a former musqueteer, in the reign of Louis XIV.—*M. F. Warner.*

1645. BAILEY, L. H. R U S; a register of the rural leadership in the United States and Canada. 2nd ed., 533 p. Ithaca, New York, 1920.—Directory of botanical and agricultural workers with brief biographical data. First edition was published Nov., 1918.—*Neil E. Stevens.*

1646. B[AKER], J. G. Matthew B. Slater. *Jour. Botany* 56: 191. 1918.—Mr. Slater (1830-1918) communicated a number of localities to Mr. J. F. Robinson for his *Flora of the East Riding*, and as the executor of Richard Spruce placed all the papers relating to Spruce's South American travels in the hands of Dr. Alfred Russell Wallace, who published them as *Notes of a Botanist on the Amazon and Andes*.—*Neil E. Stevens.*

1647. BALFOUR, F. R. S. Gaston Allard, of Angers. Roy. Bot. Gard. Kew Bull. Misc. Inform. 1918: 124-125. 1918.—Brief obituary of M. Allard, who died in January, 1918, nearly 80 years of age, and a note upon his famous arboretum, containing a large collection of trees from North America, China, Japan, and the Mediterranean littoral, which has been bequeathed to the Pasteur Institute.—*M. F. Warner.*

1648. BOIS, DÉSIRÉ. Jules Poisson (20 avril 1833—31 novembre 1919). Bull. Soc. Nat. Acclim. France 67: 18-19. 1920.—Poisson was extraordinarily gifted in his knowledge of plants, particularly in identification of fragmentary material. He described many new genera and wrote a monograph of the Casuarinaceae. The genus *Poissonia* (Leguminosae) was dedicated to him by Baillon.—*M. F. Warner.*

1649. BORZI, ANTONINO. [Giovanni Briosi.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. 29: 118-123. 1920.—Born April 29, 1846; died July 20, 1919. [See also Bot. Absts. 7, Entry 707; 8, Entry 895].—*M. F. Warner.*

1650. BOULGER, G. S. A seventeenth-century botanist friendship. Jour. Botany 56: 197-202. 1918.—Evidence of the friendship of the elder John Tradescant with Parkinson is found in the numerous passages of his *Paradisus* in which Parkinson mentions Tradescant. At the end of the copy of the *Paradisus* here discussed there is, apparently in the handwriting of John Tradescant himself, a list of plants received in various years. Also a manuscript list, almost certainly in the handwriting of Elias Ashmole, of Trees found in Mr. Tradescants Ground when it came into my Possession. The date of this list is probably about 1662.—*Neil E. Stevens.*

1651. BOWER, F. O. Botanical research in the United Kingdom during the war. Amer. Jour. Sci. 47: 117-122. 1919.—A summary of the more important botanical discoveries and publications during the period of the great war.—*Neil E. Stevens.*

1652. BRAUN, SIEGFRIED. Zum 200jährigen Jubiläum der Baumschulfirma Ludwig Späth in Berlin-Baumschulenweg am 11. September 1920. [For the celebration of the 200th anniversary of the nursery firm Ludwig Späth, September 11, 1920.] Möllers Deutsch. Gärt. Zeitg. 35: 232-233, 238-240, 258-260. Illus. 1920.—The business was founded in September, 1720, by Christoph Späth, who died May 1, 1746, aged 50 years, and has been carried on by the family for 5 successive generations: Karl Friedrich (1721-1782), Karl Friedrich, Jr. (1768-1831), Johann Ludwig Karl (1793-1883), Franz (1839-1913), and the present head of the firm, Dr. Hellmut Späth.—*M. F. Warner.*

1653. [BRITTEN, JAMES.] An averted calamity. Jour. Botany 56: 50-52. 1918.—This note deals chiefly with the contemplated appropriation of the buildings of the British Museum (Natural History) for war purposes. The last paragraph, however, names various ways in which the department of botany of that institution has rendered direct service to the government during the war.—*Neil E. Stevens.*

1654. BRITTEN, JAMES. Tournefort's "Topographie Botanique." (Bibliographical notes LXXI.) Jour. Botany 56: 118-121. 1918.—A description of a little-known manuscript, now in the Department of Botany of the British Museum, with references to information regarding this and other manuscripts of Tournefort.—*Neil E. Stevens.*

1655. BRITTEN, JAMES. Maund's "The Botanist" (1836-1842?). (Bibliographical notes LXXIII.) Jour. Botany 56: 235-243. 1918.—The first number of *The Botanist* was printed about September, 1836, and the last probably in 1842, as determined by evidence presented in this note. The magazine is described and a list of the new species published therein is given; as well as some notes on the "conductor," Benjamin Maund, and several contributors.—*Neil E. Stevens.*

1656. BRITTEN, JAMES. Blake's plant names. *Garden* 84: 80-81, 243-244, 276. 1920.—Identification of plants described under old (and very badly spelled) English common names in STEPHEN BLAKE's *Compleat Gardeners Practice*. [See also *Bot. Absts.* 8, Entries 1674, 1717.]—*M. F. Warner*.

1657. [BRITTEN, JAMES.] Clarence Bicknell. *Jour. Botany* 56: 303. 1918.—Clarence Bicknell (1842-1918) was the author of a quarto volume (1885) on the Flowering Plants and Ferns of the Riviera and Neighboring Mountains.—*Neil E. Stevens*.

1658. [BRITTEN, JAMES.] Claude Frederick Hugh Monro. *Jour. Botany* 56: 335. 1918.—Monro (died Aug. 14, 1918, aged 55) was a collector of plants in Rhodesia, and published 2 papers, 1 on the grasses and 1 on the trees of the region.—*Neil E. Stevens*.

1659. BRITTEN, JAMES. The cultivated dahlia. *Jour. Botany* 56: 33-35. 1918.—The introduction of the dahlia to the gardens of England was practically due to Lady Holland who, in 1804, sent seeds from Spain.—*Neil E. Stevens*.

1660. BRITTEN, JAMES. The Duchess of Beaufort's flower drawings. *Garden* 84: 428-429. 1920.—The Duchess, who died in 1714, was the friend of Sir Hans Sloane and in correspondence with the principal botanists and horticulturists of her day. Her herbarium, now in the Department of Botany of the British Museum (Natural History), is frequently quoted in Aiton's *Hortus Kewensis* for the first introduction of plants into England. These 2 volumes of paintings of plants grown at Badminton at the beginning of the 18th century include a great many species which have hitherto been supposed to have been introduced to living collections at a much later date, while a number of them are no longer in cultivation. The plates of the 1st volume were done by Everard Kickius and some of them are very fine; while those of the other volume, by Daniel Franckom, have less artistic merit, but are very faithful representations.—*M. F. Warner*.

1661. [BRITTEN, JAMES.] Edward Walter Hunnybun (1848-1918) and "The Cambridge British Flora." *Jour. Botany* 56: 248-250. 1918.—A short sketch of Hunnybun's life is preceded by a description of his methods of work in preparing illustrations for *The Cambridge British Flora*.—*Neil E. Stevens*.

1662. [BRITTEN, JAMES.] Ernest David Marquand (1848-1918). *Jour. Botany* 56: 187-189. 1918.—Marquand was "an all-round naturalist," best known for his studies on the flora of Guernsey.—*Neil E. Stevens*.

1663. BRITTEN, JAMES. Felix Gilbert Wiltshire (1882-1917). *Jour. Botany* 56: 117-118. 1918.—Wiltshire was in charge of the library of the Department of Botany of the British Museum from 1905 until he entered the army in 1916, and contributed various important bibliographical notes to the *Journal of Botany*.—*Neil E. Stevens*.

1664. BRITTEN, JAMES. "John" Roxburgh. *Jour. Botany* 56: 202-203. 1918.—The supposed botanist of this name seems to be fictitious. The collecting attributed to him was probably done by WILLIAM ROXBURGH, author of the *Flora Indica*, whose son James bore part of the expense of its publication.—*Neil E. Stevens*.

1665. BRITTEN, JAMES. Lady Anne Monson (c. 1714-1776). *Jour. Botany* 56: 147-149. 1918.—Lady Monson was a student of the plants and insects of the East Indies.—*Neil E. Stevens*.

1666. BRITTEN, JAMES. Morandi's 'Historica [sic] Botanica Practica.' (Bibliographical notes LXXII.) *Jour. Botany* 56: 212-217. 1918.—Description of the *Historia Botanica Practica* (Mediolani, 1744) of Giovanni Battista Morandi, and of a very interesting manuscript in the Department of Botany of the British Museum which comprises 122 original drawings for this book, and 4 works in Morandi's own hand: an *Explicatio Plantarum*, which

partly corresponds to that in the *Historia*, a *Dilucidatio vocum quibus rei Herbariae Scriptores uti solent*, and 2 smaller works.—*M. F. Warner*.

1667. BRITTEN, JAMES. *The name Mundia*. Jour. Botany **56**: 56. 1918.—The name seems to have been given in honor of a collector of South African plants named Mundt or Mund, not in honor of Henry Mundy.—*Neil E. Stevens*.

1668. [BRITTEN, JAMES.] *Newspaper botany*. Jour. Botany **58**: 136, 208. 1920.—Errors and absurdities noted in the *Daily News* and *Nash's Magazine*.—*M. F. Warner*.

1669. [BRITTEN, JAMES.] *The shamrock*. Jour. Botany **58**: 117–118. 1920.—Some newspaper blunders in regard to this plant.—*M. F. Warner*.

1670. BRITTEN, JAMES. *Sir George Birdwood and "Primrose Day."* Jour. Botany **56**: 87–90. 1918.—Sir George Christopher Molesworth Birdwood (1832–1917) was particularly interested in commercial vegetable products of Biblical and classical interest and was the first to identify the frankincense plant. The celebration of the anniversary of Lord Beaconsfield's death by the wearing of primroses was initiated by him.—*Neil E. Stevens*.

1671. BRITTEN, JAMES. *Worthington George Smith (1835–1917)*. Jour. Botany **56**: 243–247. 1918.—W. G. Smith was educated as an architect and illustrator, but the study of ancient ornament led him to the study of plant form and later to botany. He is known for his researches on fungi, and especially for his colored illustrations of fungi and other plants. [See also Bot. Absts. 6, Entry 62; 8, Entry 1683.]—*Neil E. Stevens*.

1672. BROTHERSTON, R. P. *About tomatoes*. Garden **83**: 86. 1919.—As early as 1578 both white and yellow sorts were recorded by Lyte as cultivated in England. They were often called "Love apples" or "Apples of love" in the early literature, but the true "Love apple" was *Solanum ovigerum*.—*M. F. Warner*.

1673. BROTHERSTON, R. P. *Bacon's plants*. Garden **84**: 129. 1920.—It is concluded that the double white violet mentioned in Bacon's essays and *Sylva sylvarum* was a stock, and the "White Satyrian" of the *Sylva* was *Neottia spiralis*.—*M. F. Warner*.

1674. BROTHERSTON, R. P. *Blake's plant names*. Garden **84**: 52. 1920. [See also Bot. Absts. 8, Entries 1656, 1717.]

1675. BROWNE, E. T. *Ernst Heinrich Philipp August Haeckel*. Proc. Linn. Soc. London **132**: 39–43. 1921.—Sketch of the life and work of the eminent zoologist and evolutionist Ernst Haeckel (1834–1919), who in earlier years was also an enthusiastic botanist.—*M. F. Warner*.

1676. BUNYARD, E. A. *The moon and horticulture*. Garden **84**: 186. 1920.

1677. BUNYARD, E. A. *The "New orchard and garden" of William Lawson*. Jour. Pomology **1**: 125–134. Fig. 16. 1920.—Although Johnson's *History of English Gardening* gives the date as 1597, Lawson's book seems to have been actually published in 1617, and to have gone through 9 editions. Bunyard quotes from, and comments briefly upon, the different chapters.—*L. H. MacDaniels*.

1678. C., R. S. *Curtis's "Botanical magazine"*. Garden **84**: 3. 1920.—Varying dates in early volumes, and variations in date of same plate in different sets are noted. Dates on title-pages of an original set are 1787, 1788, 1790, etc., but a short set has 1790 as date of Vol. 1; and in a set of 45 Vols., evidently reprints, Vol. 1 is dated 1793. Dates of many individual plates are noted, but no water marks were discovered before 1810.—*M. F. Warner*.

1679. CARDIFF [WALES] PUBLIC LIBRARY. Catalogue of early works on botany, agriculture, and horticulture. Exhibited in connection with the Royal Agricultural Show. 23 p. Printed for the Library Committee of the Cardiff Corporation by the Western Mail Ltd.: Cardiff, 1919.—A brief list, but with rather full titles and full imprints. Annotated and arranged under date of 1st edition.—*Neil E. Stevens.*

1680. CAVARA, FRIDIANO. In memoria di tre botanici napoletani. [In memory of three Neapolitan botanists.] Bull. Orto Bot. Napoli 4: 317–327. Portraits. 1918.—FORTUNATO PASQUALE (1856–1917), whose interest was in the local flora of southern Italy. ORAZIO COMES (1848–1917), was specially known for his work in phytopathology, wrote many mycological works, and made an extended study of tobacco. ACHILLE TERRACIANO (1861–1917), worked in systematic and geographical botany and plant morphology.—*M. F. Warner.*

1681. CHRISTENSEN, H. R. Frederik Kølpin Ravn. Tidsskr. Landøkonomi 1920: 261–264. Portrait. 1920.—Born at Aalborg, Denmark, May 10, 1873, and died May 25, 1920, at East Orange, New Jersey. A short account of his life and work in plant pathology.—*M. F. Warner.*

1682. CLINTON, G. P. William Gilson Farlow. Phytopathology 10: 1–8. Portrait. 1920.—An appreciation of the work of W. G. Farlow (1844–1919) with personal notes and anecdotes, written by a former student and close personal friend. [See also Bot. Absts. 6, Entries 916, 947, 956, 963, 1463, 1470; 7, Entry 1593; 8, Entries 833, 1784, 1785.]—*Neil E. Stevens.*

1683. C[OTTON], A. D. Worthington G. Smith. Roy. Bot. Gard. Kew Bull. Misc. Inform. 1918: 30–31. 1918.—Obituary notice of W. G. Smith (1835–1917), best known to readers of the Gardeners' Chronicle for his illustrations made for that journal for more than 40 years, but who was also an antiquarian and a well-known mycologist.—*M. F. Warner.*

1684. COULTER, J. M. Journal of the Arnold Arboretum. Bot. Gaz. 69: 95–96. 1920.—A notice of the appearance of the first number (July, 1919) of this new quarterly journal.—*H. C. Cowles.*

1685. D. The lettuce. Gard. Chron. III, 67: 192–193, 201. Figs. 1920.—Chiefly cultural, but prefaced by notes on early history. There are 6 varieties mentioned by Gerarde (1597), and 15 in Miller's Gardeners' Dictionary (1757). There are differences of opinion in regard to the origin of the Cabbage and Cos lettuces, but both are probably from one species, *Lactuca scariola*, a native of central Europe and Asia. Crescentius (13th century) mentions *Lactuca romana*, which probably gave name to the French Laitue romaine or Romaine.—*M. F. Warner.*

1686. DEMAREST, S. A. A sketch of the life of Coe Finch Austin. Mem. Torrey Bot. Club 17: 31–38. 1918.—An intimate account by his daughter of C. F. Austin (1831–1880) who was best known for his work on mosses.—*Neil E. Stevens.*

1687. DETMER, WILHELM. Ernst Stahl, seine Bedeutung als Botaniker und seine Stellung zu einigen Grundproblemen der Biologie. [Ernst Stahl, his importance as a botanist and his position regarding some fundamental problems in biology.] Flora 111–112: 1–47. 1918.—The introduction deals briefly with the education and personality of Christian Ernst Stahl, but the bulk of the paper is devoted to a detailed review of his work, including both the results of his investigations in various fields, and his opinions on such questions as vitalism and natural selection. [See also Bot. Absts. 8, Entry 1697.]—*Neil E. Stevens.*

1688. DIXON, H. N. Robert Braithwaite (1824–1917). Jour. Botany 56: 23–25. 1918.—An appreciation of the scientific work of Dr. Braithwaite, especially in bryology. His herbarium is now in the British Museum (Natural History).—*Neil E. Stevens.*

1689. DURHAM, H. E. Past masters of garden craft. [Rev. of: MARSHALL, LIZZIE B. *L'horticulture antique et la poésie de Columelle (De re rustica livre X)*. Thèse accepté pour le doctorat de l'Université de Paris. Hachette et Cie.: Paris, 1918.] *Gard. Chron.* III, 66: 77. 1919.—"Columella wrote to guide the gardener with much detail and precision, and especially to help the owner of a small plot that he might reduce his daily bill for food by growing it himself." Eleven flowers are dealt with, and vegetables and herbs together to the number of 63, including 15 Brassicas.—*M. F. Warner*.

1690. DURHAM, H. E. What is a broccoli? *Gard. Chron.* III, 65: 243-244. 1919.—Historical and etymological note.—*Neil E. Stevens*.

1691. E[BERLE], E. G. Henry Hurd Rusby. *Jour. Amer. Pharm. Assoc.* 9: 1131-1132. *Portrait*. 1920.—A brief sketch of the life and activities of Doctor Rusby, who has been recently appointed to take charge of the Mulford Biological Exploration of the Amazon Basin.—*Anton Hogstad, Jr.*

1692. ESSARY, S. H. Samuel McCutchen Bain. *Phytopathology* 10: 185-188. *Portrait* (pl. x). 1920.—Born Eagleville, Tennessee, Jan. 14, 1869; died Knoxville, Jan. 30, 1919. His investigations on disease resistance in plants and his work as a teacher of botany are referred to. A chronological list of his publications is given.—*Neil E. Stevens*.

1693. FEDELI, CARLO. Il primo Orto botanico Pisano. [The first botanical garden of Pisa.] *Atti. Soc. Toscana Sci. Nat. Pisa* (Proc. Verb.) 27: 8-20. 1918.—Its original location in the "Cittadella Vecchia," or ancient citadel, is confirmed, and by careful comparison of documents the author clears up some confusion in dates, proving that on Oct. 27, 1544, the duke Cosimo I had already removed the monastery of S. Vito to make room for the garden; that Luca Ghini, then lecturer at Bologna, who had been invited to the chair of botany at Pisa, had not arrived there on Oct. 28, 1544, but that his first remuneration was recorded on the first Monday of March, 1545, while one of his letters, dated July 4, 1545, shows that the garden was functioning perfectly at that date.—*M. F. Warner*.

1694. FOËX, ETIENNE. Rapport sommaire sur la situation de la Société de Pathologie Végétale, au 31 décembre 1920. [Report of the condition of the Phytopathological Society of France. December 31, 1920.] *Bull. Soc. Path. Veg. France* 7: 133-134. 1920.—Report of the general secretary calling attention to the increase in membership and cooperative arrangements made with agricultural journals and also with the federation of natural history societies of France.—*C. L. Shear*.

1695. G[AMBLE], J. S. J. H. Lace, C.I.E., F.L.S. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1918: 341. 1918.—John Henry Lace, who died in June, 1918, spent over 30 years as forest officer in the Punjab, British Baluchistan, Bengal, and Burma, and was an accurate botanist. His List of the Trees, Shrubs, and Climbers of Burma is the standard work in that field, and he described many new species in the *Decades Kewenses*. A nearly complete set of his collections is found at Kew, while his own herbarium has been presented to the Royal Botanic Garden at Edinburgh.—*M. F. Warner*.

1696. GAMBLE, J. S. John Henry Lace. *Proc. Linn. Soc. London* 131: 56-57. 1919.—Brief sketch of life and work of J. H. Lace (1857-1918) forest officer and botanist. [See also *Bot. Absts.* 8, Entry 1695.]—*M. F. Warner*.

1697. GERHARDT, KARL. Dem Andenken an Ernst Stahl. *Naturwiss. Wochenschr. N.F.*, 19: 145-149. 1920.—In memory of Christian Ernst Stahl, born June 21, 1848, died December 3, 1919. Estimate of his botanical work and appreciation of Stahl as teacher and friend. [See also *Bot. Absts.* 8, Entry 1687.]—*M. F. Warner*.

1698. GROSE, L. R. Maple sugar in colonial times. *Amer. Forestry* 26: 689-690. 1920.—Tench Coxe, in his *View of the United States* (Philadelphia, 1794), recommended the sugar

maple lands of Pennsylvania and New York as a source of general sugar supply for the United States. Although negligible from this point of view, maple sugar was of great importance among the colonial settlers and the Indians, as shown by quotations from early accounts as far back as 1684, in regard to the making of sugar from the "juice of the maple."—*A. C. Atwood.*

1699. GROVES, JAMES. *Newspaper botany.* Jour. Botany **58**: 55. 1920.—Criticism of an article in the Daily Telegraph of January 14, 1920, which includes among noxious weeds *Spartina Townsendii*, well known for its value as a mud-binding plant.—*M. F. Warner.*

1700. GUADAGNO, MICHELE. *La vegetazione della penisola sorrentina.* [Flora of the Sorrento peninsula.] Bull. Orto Bot. Napoli **4**: 133-178. 1918.—A list of works relating to this region, a branch of the Apennines terminating in the island of Capri, together with a brief physical description, and a very full account of botanical exploration from early times. Species described by early authors are enumerated, and a list of those collected by PIER ANTONIO MICHELI in 1710 is printed from his manuscript catalogue of 1714. Biographical data are supplied for many of the older and more obscure authors and collectors.—*M. F. Warner.*

1701. GUNTHER, R. T. *The garden of the Rev. Walter Stonehouse at Darfield Rectory, in Yorkshire, 1640.* Gard. Chron. III, **67**: 240-241, 256, 268-269, 296. Fig. 116, 187. 1920.—Stonehouse was a friend and correspondent of William How, author of *Phytologia Britannica* (1650). He was established at Darfield in 1631, but after 1644 forcibly ejected by the Parliamentary Commissioners and imprisoned; he died in 1655, aged 58. Among the manuscripts of Magdalen College are 2 lists of plants grown at Darfield in 1640-1644, which are printed herewith; also plans of the garden and saffron garth in 1640. Stonehouse estimated the number of his plants as 866 in 1644, and they included 14 species from Virginia, 5 from Guinea, and 4 from New England. [See also Bot. Absts. 7, Entry 699.]—*M. F. Warner.*

1702. H[ALL], A. D. *Spencer Pickering.* Nature **106**: 509-510. 1920.—Percival Spencer Umfreville Pickering (1858-1920) began his scientific career as a chemist, brilliantly demonstrating the hydrate theory of solution. His most important work, however, has been on the scientific problems of fruit growing, notably the poisonous effect upon trees of the root-excretions of grasses. *Science and Fruit Growing*, published in 1919, embodies the results of the Woburn experiments since 1896.—*M. F. Warner.*

1703. HAMBLIN, S. F. *Gardening books for the client.* Landscape Architecture **10**: 121-127. 1920.—List of about 85 modern books, grouped under: (1) nature study and botany; (2) garden plants; (3) garden making; and (4) garden experiences.—*N. E. Stevens.*

1704. HARRIS, D. F. *Anthony van Leeuwenhoek, the first bacteriologist.* Sci. Monthly **12**: 150-160. 1921.—This paper describes a bacteriologist's visit to Leeuwenhoek's grave and native city and his thoughts concerning some of the early workers.—*L. Pace.*

1705. HARSHBERGER, J. W. *The old gardens of Pennsylvania, I.—Bartram arboretum and park.* Garden Mag. **32**: 78-80. Illus. 1920.—Begun by John Bartram in 1730, at Kingessing, now within the city of Philadelphia. In it were planted many of the trees, shrubs, and herbs collected by Bartram and his son William on their travels. A number of the surviving old trees are mentioned and illustrated.—*M. F. Warner.*

1706. HARSHBERGER, J. W. *The old gardens of Pennsylvania, II.—Humphry Marshall's.* Garden Mag. **32**: 137-139. Illus. 1920.—The arboretum of Humphry Marshall (Oct. 10, 1722-Nov. 5, 1801) was founded in 1773 near the present village of Marshallton in Chester county. Many large trees are still standing which were planted by him, and which furnished practical knowledge for his *Arbustrum Americanum: the American Grove* (Philadelphia, 1785). The article is illustrated with photographs of some of these old trees and views of Marshall's house.—*M. F. Warner.*

1707. HEMSLEY, W. B. J. R. Jackson. *Gard. Chron.* III, 68: 234. 1920.—John Reader Jackson, born May, 1834; died October 28, 1920. In 1858 he became keeper of the Kew museums, which post he held until his retirement in 1901. He wrote many articles on economic botany for the *Technologist*, *Pharmaceutical Journal*, *Gardeners' Chronicle*, and other periodicals, and published a valuable work, *Commercial Botany of the Nineteenth Century*.—*M. F. Warner*.

1708. HENNING, ERNST. F. Kølpin Ravn. *K. Landtbruks Akad. Handl. och Tidsskr.* 59: 352-354. *Portrait*. 1920.—Account of his life and mycological work. [See also *Bot. Absts.* 8, Entries 1641, 1681, 1804.]—*M. F. Warner*.

1709. HOEK, P. VAN. *Lijst van officieele personen, Instellingen en Vereenigen op Land-en Tuinbouwgebied*. [List of officials, institutions and societies in agriculture and horticulture.] *Verslag. en Mededeel. Directie Landb.* [Nederland] 1919²: 1-156. 1919.—A list, with names of officials, of all agricultural and horticultural government and private institutions, laboratories, colleges, schools, societies, in the Netherlands.—*J. C. Th. Uphof*.

1710. HOEK, P. VAN. *Lijst van officieele personen, Instellingen en Vereenigen op Land-en Tuinbouwgebied*. [List of officials, institutions and societies in agriculture and horticulture.] *Verslag. en Mededeel. Directie Landb.* [Nederland] 1920²: 1-120. 1920.—A list with names of officials, of all agricultural and horticultural government and private institutions, laboratories, colleges, schools, and societies in the Netherlands.—*J. C. Th. Uphof*.

1711. HOFFMANN, PAUL. *Urkundliches von und über Christ'an Conrad Sprengel*. [Documentary records by and about Christian Conrad Sprengel.] *Naturwiss. Wochenschr.* N.F., 19: 692-695. 1920.—Records of Sprengel's birth, matriculation at the University of Halle, and other important events in his life are reproduced.—*Neil E. Stevens*.

1712. HOLMAN, G. H., AND F. S. CHAMBERS. *Cranberry pioneers of Ocean County*. *Proc. Amer. Cranberry Growers' Assoc. Ann. Convention* 50: 7-10. 1919.—This is a sketch of the history of cranberry growing in Ocean County, New Jersey.—*J. K. Shaw*.

1713. HOLMES, G. K. *Three centuries of Tobacco*. *U. S. Dept. Agric. Yearbook* 1919: 151-177. 1920.—A statistical presentation of the important facts and factors in the development of the tobacco industry in its agricultural, commercial and industrial aspects from colonial times to the present. Analysis of consumption shows a great gain in use, being now two-thirds of production. The analysis of the industrial aspect shows the industry to be one of considerable magnitude and importance. A brief note is included on tobacco in use among natives of the Americas before European settlement and on the beginnings of cultivation in the Virginia Colony, where the first was grown by John Rolfe at Jamestown in 1612.—*C. J. Shirk*.

1714. J[ACKSON], B. D. Henry Worsley Seymour Worsley-Benison. *Proc. Linn. Soc. London* 131: 67. 1919.—Born Aug. 14, 1845; died Dec. 14, 1918. He was lecturer in botany at Westminster Hospital, 1877-1889, and wrote two popular books on natural history, as well as papers on Darwin, and on the power of movement in plants.—*M. F. Warner*.

1715. J[ACKSON], B. D. Sir Frank Crisp. *Proc. Linn. Soc. London* 131: 49-51. 1919.—Obituary of Sir Frank Crisp (1843-1919), a lawyer whose hobby was microscopy, who had a fine museum of instruments and apparatus, with a complete collection of books on the microscope. As one of the secretaries of the Royal Microscopical Society he effected great improvements in its Journal from about 1878. He was also a generous patron of the Linnean Society.—*M. F. Warner*.

1716. JACOB, JOSEPH. C. G. van Tubergen (died January 25, 1919, aged 74 years). *Garden* 83: 87. 1919.—Personal appreciation of the head of the Haarlem firm of bulb growers of that name.—*Neil E. Stevens*.

1717. JACOB, JOSEPH. "The compleat gardener's practice." I-II. Garden **84**: 6-7, 20-21. 1920.—A very rare book by "Stephen Blake, gardener," London, 1664. Nothing is known of him save what may be learned from this book, which is especially interesting for its vernacular names of plants, now mostly obsolete and many of them unrecognizable on account of Blake's erratic spelling. [See also Bot. Absts. 8, Entries 1656, 1674.]—*M. F. Warner*.

1718. JACOB, JOSEPH. Orange thyme. Garden **83**: 111. 1919.—After an exhaustive search this herb was found listed in The Modern Gardener or Universal Kalendar, published from the manuscript of Thomas Hitt by James Meader in 1771.—*Neil E. Stevens*.

1719. JACOB, JOSEPH. Some tales of the tulip. Garden Mag. **32**: 23-35. *Illus.* 1920.—Reference is made to the literature of the tulip mania in Holland (1635-1637), such as T'Samenspraecken tusschen Waermondts ende Gaergoedt, published by Adriaen Roman at Haarlem in 1637. The tulip has made a place for itself in general literature as well, for instance Addison's letter to the Tatler, Aug. 31, 1710, Edward Young's Universal Passion, 1725, and Jean de la Bruyère's Characters, originally published in 1688 and often translated into English. The Hortus Floridus of Crispin de Pas, 1614, is also mentioned, and the first tulip monograph, Le Floriste François by La Chesnée Monstereul, which was printed at Caen in 1654. One of the illustrations is a reproduction of the title-page of the latter which was printed at Rouen in 1658 and added to the original work. Other more modern literature is mentioned, concluding with the important historical study, Weizen und Tulpe, of Solms-Laubach, published in 1899.—*M. F. Warner*.

1720. JACOB, JOSEPH. Tulip tittle-tattle.—An early reference to tulip fanciers. Garden **84**: 525. 1920.—Sir Thomas Browne, in his Garden of Cyrus, or the Quincunciall Lozenge, mentions the tulip, and gives marginal references to the works of Lauremberg and Petrus Hondius, whose Dapes Inemptae (probably published about 1619), records and disapproves the growing taste for tulips; while Lauremberg uses the word "Tulipomania" in 1632, 3 years before the time of the mania in Holland.—*M. F. Warner*.

1721. JÄGGLI, MARIO. L'attività scientifica di Alberto Franzoni. [The scientific activity of Alberto Franzoni.] Boll. Soc. Ticinese Sci. Nat. **1919**: 11-18. 1919.—An address delivered at Locarno on November 19, 1916, is here reported. The speaker calls attention to the important work of Alberto Franzoni as a botanical explorer in southern Switzerland and gives a description of his herbarium. The latter contains about 5500 phanerogams and over 1000 cryptogams, the mosses being particularly well represented.—*A. W. Evans*.

1722. JOHNSON, D. S. The Cinchona tropical botanical station again available. Science **51**: 235-236. 1920.

1723. KILLERMANN, S[EBASTIAN]. Von einigen peruanischen Neueinführungen in unseren Gärten um 1600. [Regarding some Peruvian introductions into our gardens about 1600.] Naturwiss. Wochenschr. N.F., **19**: 369-373. 1920.—The sun flower (*Helianthus annuus* L.), four o'clock (*Mirabilis Jalapa* L.), and passion flower (*Passiflora* sp.)—*Neil E. Stevens*.

1724. KILLERMANN, S[EBASTIAN]. Zur älteren Geschichte der Orchideen. [On the early history of the orchids.] Naturwiss. Wochenschr. N.F., **19**: 351-357. 1920.—Early literature on orchids is cited. The discussion deals with the classification rather than the culture or introduction of these plants.—*Neil E. Stevens*.

1725. KÜSTER, ERNST. Albertus Magnus und Goethe. Naturwissenschaften **6**: 137-139. 1918.—Goethe's debt to the writings of Albertus de Bollstadt, or Albertus Magnus (13th century).—*Neil E. Stevens*.

1726. KÜSTER, ERNST. Einige alte Gallenbilder. [Some ancient illustrations of galls.] Naturwiss. Wochenschr. N.F., **18**: 766-769. *Fig. 1-3.* 1919.—Three figures of galls on *Quercus* originally published in the 15th and 16th centuries, are reproduced and discussed.—*Neil E. Stevens*.

1727. KÜSTER, ERNST. Georg Klebs (1857-1918). *Naturwissenschaften* 6: 681-683. 1918.—Outline of life and estimate of scientific work.—*Neil E. Stevens*.

1728. LAING, E. V. *Trees in myth and legend*. Trans. Roy. Scottish Arboric. Soc. 34: 195-209. 1920.—The article discusses the attitude of our ancestors and the ancients toward trees and the effect which trees had on the general trend of the lives of men; and deals in a general way with a few myths and legends about trees.—*C. R. Tillotson*.

1729. LONGO, BIAGIO. In memoria del Dott. Martino Savelli. *Bull. Soc. Bot. Ital.* 1919: 1-2. 1919.—Born Jan. 10, 1884; died Dec. 28, 1918. A brief note with list of 12 titles, chiefly mycological, published by Savelli.—*M. F. Warner*.

1730. LOYER, MAURICE. Henri Hua (1861-1919). *Bull. Soc. Nat. Acl'm. France* 66: 161-163. 1919.—Brief obituary notice and personal appreciation.—*Neil E. Stevens*.

1731. MACOUN, W. T. [R. B. Whyte.] *Proc. Amer. Soc. Hort. Sci.* 15: 116. *Portrait*. 1918.—R. B. Whyte of Ottawa died Apr. 15, 1918. His garden contained the finest collection of herbaceous perennials in Canada, possibly in all America. He originated the Herbert raspberry in 1887, and was specially interested in the English gooseberry, having tested over 100 varieties. He had a large herbarium.—*M. F. Warner*.

1732. MANETTI, CARLO. Italo Giglioli. *Agric. Coloniale* 14: 401-404. *Portrait*. 1920.—An agricultural chemist and economist, born at Genoa, May 1, 1852, and died Oct. 1, 1920. A personal appreciation, with list of some 63 works, published between 1878 and 1918. [See also *Bot. Absts.* 8, Entry 1748.]—*M. F. Warner*.

1733. MARSHALL, L. B. *L'horticulture antique et le poëme de Columelle (De re rustica livre X)*. Thèse accepté pour le doctorat de l'Université de Paris. [Ancient horticulture and the poem of Columella (De re rustica liber X.) Doctorate thesis, University of Paris.] Hachette et Cie.: Paris, 1918.—See *Bot. Absts.* 8, Entry 1689.

1734. MARZELL, HEINRICH. Ueber Alter und Herkunft deutscher Pflanzennamen. [On the age and origin of German plant names.] *Naturwiss. Wochenschr. N.F.*, 19: 641-645. 1920.—A somewhat popular discussion of the etymology of over 200 plant names.—*Neil E. Stevens*.

1735. MATTIROLO, ORESTE. P. A. Saccardo. *Bull. Soc. Bot. Ital.* 1920: 2-3. 1920.—A brief eulogy of Saccardo by the president of the Italian botanical society. [See also *Bot. Absts.* 8, Entries 1791, 1797.]—*M. F. Warner*.

1736. MATTIROLO, ORESTE. Saverio Belli. *Bull. Soc. Bot. Ital.* 1919: 21-22. 1919.—Saverio Belli was born at Domodossola May 25, 1852 (incorrectly printed 1892), and died April 7, 1919.—*Neil E. Stevens*.

1737. MERRILL, E. D. Page-heading of periodicals. *Jour. Botany* 56: 189. 1918.—In recent volumes of the Philippine Journal of Science there is printed "on alternate pages the title of the publication and title of article with name of the author, supplemented by the volume, number, and year." The upper right-hand corner of each new article bears the name of the publication, volume, year, and number.—*Neil E. Stevens*.

1738. MOLISCH, HANS. Goethe, Darwin und die Spiraltendenz im Pflanzenreich. [Goethe, Darwin, and the spiral tendency in the plant kingdom.] *Naturwiss. Wochenschr. N.F.*, 19: 625-629. *Fig. 1-3*. 1920.—A popular discussion of the subject, with some citations of literature, including the work of the two authors named in the title.—*Neil E. Stevens*.

1739. MOLL, J. W. In memoriam Dr. S. H. Koorders. *Nederland. Kruidk. Arch.* 1919: 73-76. 1920.—Brief summary of Koorders' work, especially on the herbarium of woody plants of Java, numbering over 1100 species.—*M. F. Warner*.

1740. MONTEMARTINI, LUIGI. Giuseppe Cuboni. *Riv. Patol. Veg.* **10**: 117-118. 1920.—Prof. Giuseppe Cuboni, director of the experiment station of vegetable pathology, died suddenly in Rome on Nov. 3, 1920. He was born at Modena in 1852. [See also Bot. Absts. 8, Entry 1763.]—*F. M. Blodgett.*

1741. MORSTATT, H. Die Entwicklung der Pflanzenpathologie und des Pflanzenschutzes. [The development of plant pathology and plant protection.] *Naturwiss. Wochenschr. N.F.*, **19**: 817-822. 1920.—Some of the more important steps in the development of plant pathology in Germany and the U. S. A. are mentioned, with somewhat briefer reference to other countries. The various organizations and conferences which have contributed to the advancement of the international study of plant disease problems are mentioned. In conclusion, the interrelation of pathology, morphology, and physiology is pointed out.—*Neil E. Stevens.*

1742. MURRILL, W. A. The fruit-disease survey. *Mycologia* **13**: 50-53. *Pl. 3.* 1921.—An account of the field meeting of phytopathologists in Virginia, West Virginia, Maryland, and Pennsylvania during the first week in August, 1920, for the study of fruit diseases. This meeting was of an international character, and was attended by Mr. W. B. Brierley of England, Mr. E. Foëx of France, and Mr. Rosatti of Italy.—*H. R. Rosen.*

1743. MURRILL, W. A. George Francis Atkinson. *Jour. New York Bot. Gard.* **19**: 314-315. 1918.—Note of death on Nov. 14, 1918. [See also Bot. Absts. 8, Entry 1803.]—*Neil E. Stevens.*

1744. PAMPANINI, RENATO. Odoardo Beccari. *Agric. Colon.* **14**: 449-453. 1920.—Beccari died at Florence Oct. 26, 1920, at the age of 77. From 1864 to 1880 he was chiefly engaged in exploration: With Doria in Borneo; in Eritrea; in New Guinea with D'Alberty; and in Sumatra. He had already published some results of his earlier travels, and in 1868 founded the *Nuovo Giornale Botanico Italiano*, to which he made numerous contributions. Upon his return to Italy in 1880 he devoted himself to his vast botanical collections, publishing his *Malesia* in 3 great volumes, with many monographic works on his special subject of palms, of which the 4 folio volumes in the *Annals of the Calcutta Botanic Garden* are the most important. He helped to establish the *Istituto Agricolo Coloniale Italiano*, at Florence. His botanical collections are in Florence, at the *Istituto di Studi Superiore*.—*M. F. Warner.*

1745. PANTANELLI, ENRICO. [C. A. Timiriazeff.] *Riv. Biol.* **2**: 442. 1920.—Timiriazeff's death was announced in *Nature*, June 3, 1920. He was born in 1843 and was well known for his popular scientific works, several of which passed through many Russian editions, while others were translated into English. His experimental researches were summarized in a lecture before the Royal Society of London in 1903, on *The Cosmical Function of the Green Plant*.—*M. F. Warner.*

1746. PANTANELLI, ENRICO. Giuseppe Severini. *Ann. Botanica* **15**: 54-56. *Portrait.* 1920.—Severini was born June 17, 1878; died April 17, 1918. A chronological list of his publications, 14 in number, comprises contributions on root bacteria, plant diseases, and plant nutrition, and papers on the fungi of Perugia.—*M. F. Warner.*

1747. PANTANELLI, ENRICO. Wilhelm Pfeffer (1845-1920). *Riv. Biol.* **2**: 329-331. *Portrait.* 1920.—Summary and appreciation of Pfeffer's work in botany. [See also Bot. Absts. 8, Entries 1753, 1758.]—*M. F. Warner.*

1748. PARIS, GIULIO. Italo Giglioli. *Riv. Biol.* **2**: 696-704. *Portrait.* 1920.—Giglioli died Oct. 1, 1920. He was born May 1, 1852, the son of Giuseppe Giglioli and Elena Hillyer of Blackheath (London). The article discusses his work as a teacher of agricultural chemistry at the *Scuola Superiore di Agricoltura* of Portici and at the University of Pisa; and his ability as an organizer and director of research. He was instrumental in establishing experimental

fields, on the Rothamsted plan, at Suessola, where a great number of experiments with different cereals were carried out between 1887 and 1904. His biological work was wholly concerned with plant production, and he was greatly interested in agricultural education and organization, and economics. During the war he threw himself ardently into the solution of various economic problems, and wrote much in the way of propaganda.—*M. F. Warner.*

1749. PAYNE, C. H. *Le chrysanthème en Chine*. *Le Chrysanthème* **24**: 70-73, 88-89. 1920.—Reprint of original French text of the account of the chrysanthemum from *Mémoires concernant l'histoire &c. des Chinois*, Vol. 1, 1778, together with comment thereon in *Gardeners' Chronicle*, Dec. 14, 1918. [See also *Bot. Absts.* 8, Entry 891.]—*Neil E. Stevens.*

1750. PAYNE, C. H. *Did the tulip mania ever reach Italy?* *Garden* **83**: 528. 1919.—Although Italian floricultural literature of the 17th century shows that the tulip was much grown and highly esteemed, there is no evidence that the mania in its violent form ever extended to Italy. [See also *Bot. Absts.* 8, Entry 848.]—*Neil E. Stevens.*

1751. P[AYNE], C. H. *M. Anatole Cordonnier*. *Gard. Chron.* **III**, 68: 246. 1920.—Cordonnier, who died at Turcoing, Nov. 3, 1920, in his 78th year, founded important nurseries at Bailleul, which were utterly destroyed by the fighting in that region during the war. During his earlier career he made a specialty of growing chrysanthemums, and published 2 small books on the subject, as well as others on fruit culture under glass.—*M. F. Warner.*

1752. PAYNE, C. H. *A rare old gardening book*. *Garden* **84**: 357. 1920.—The Orchard and the Garden, published in London, 1602, does not appear to be mentioned anywhere save in Mrs. Cecil's *History of Gardening*. Is it possibly a reprint of some earlier publication? It is unlikely that Lawson's *New Orchard and Garden* is a reprint of this work, as Lawson's book was first published in 1597.—*M. F. Warner.*

1753. P[EARCE], G. J. *Wilhelm Pfeffer*. *Science* **51**: 291-292. 1920.—A sketch of the life of Wilhelm Pfeffer (1845-1920) pioneer plant physiologist and professor at Leipzig for over thirty years, by one of his American students.—*Neil E. Stevens.*

1754. PHILLIPS, E. P. *The importance of a properly equipped state herbarium to an agricultural country*. *South African Jour. Nat. Hist.* **2**: 18-39. 1920.—Shows how systematic botany is fundamental to research—the need of a collection of specimens for reference and comparison—importance of preserving economic species as a mere matter of record—need of careful determination of host-plants in the study of phytopathological problems. A number of references on economic botany and the organization and work of botanical institutions are appended.—*M. F. Warner.*

1755. PIROTTA, ROMUALDO. *Pasquale Baccarini (5 aprile 1858—24 luglio 1920)*. *Nuovo Gior. Bot. Ital.* **N.S.**, **26**: 235-244. *Portrait*. 1919 [1920].—Baccarini's genius for organization was shown at the Botanical Institute of Florence, where he carried on the work begun by Mattiolo. One of his great achievements was the establishment of the colonial herbarium at Florence. A list of 132 publications by him shows the diversity of his interests,—pathological, floristic, morphological, and historical.—*M. F. Warner.*

1756. PITTIER, HENRI. *La evolución de las ciencias naturales y las exploraciones botánicas en Venezuela*. [The evolution of natural science and botanical exploration in Venezuela.] *Suplemento del No. 14 de "Cultura Venezolana."* 28 p. *Tip. Cultura Venezolana*: Caracas, 1920.—A series of lectures entitled *Botánica y Biología*, by Dr. DIEGO CARBONELL, takes up the evolution of natural history in Venezuela, distinguishing 3 periods: (1) That influenced by Humboldt; (2) the experimental period, influenced by Vargas; and (3) the "doctrinary" period of Ernst and Villavicencio. Pittier differs with this classification, maintaining that such periods involve great leaders, such as Darwin, Haeckel, or Candolle, who have been lacking in Venezuela, and that botany is still in the exploration and collecting stage there, while agriculture has also made little progress. He takes up the botanical explorers of Vene-

zuela chronologically, beginning with PETER LOEFFLING, who collected in 1754, N. J. von JACQUIN, HUMBOLDT, SCHOMBURGK, KARSTEN, PREUSS, and others, and concludes the work with a short bibliography on Venezuelan botany.—*P. G. Russell.*

1757. PRAIN, DAVID. Anne Casimir Pyramus de Candolle. *Proc. Linn. Soc. London* **131**: 51-52. 1919.—Personal appreciation of Casimir de Candolle, born Feb. 26, 1836, died Oct. 3, 1918.—*M. F. Warner.*

1758. PRINGSHEIM, HANS, UND E. G. PRINGSHEIM. Wilhelm Pfeffer. *Ber. Deutsch. Chem. Ges.* **53**: 36-39. 1920.—Obituary of Pfeffer (born March 9, 1845), with an estimate of his work as a physiologist.—*Neil E. Stevens.*

1759. R[AMSBOTTOM], J[OHN]. John Snell. *Jour. Botany* **58**: 158. 1920.—John Snell, whose death occurred at Preston, April 19, 1920, in his 42d year, was known in connection with the Ormskirk potato trials, testing varieties with reference to wart disease (*Chrysophlyctis endobiotica*).—*M. F. Warner.*

1760. REDDICK, D. New abstract journal. *Phytopathology* **11**: 29. 1921.—The appearance of *Zentralblatt für die gesamte Landwirtschaft mit Einschluss der Forst- und Teichwirtschaft, der Tier-Pathologie, und Medizin* from the press of Gebrüder Borntraeger, Berlin, is noted.—*B. B. Higgins.*

1761. RIDDELL, W. R. The pharmacopoeia of another botanical physician. *Trans. and Proc. Bot. Soc. Edinburgh* **28**: 1-23. 1920.—Plants employed by Samuel B. Emmons in his *Vegetable family Physician* (Boston, 1836).—*M. F. Warner.*

1762. RITTER, GEORG. Friedrich Ludwig. *Beih. Bot. Centralbl.* **36** (I. Abt.): 133-134. 1919.—Friedrich Ludwig was born Oct. 24, 1851, died July 22, 1918.—*Neil E. Stevens.*

1763. RIVERA, VINCENZO. Giuseppe Cuboni. *Riv. Biol.* **2**: 693-696. *Portrait.* 1920.—Cuboni was born at Modena Feb. 2, 1852, and died at Rome, Nov. 3, 1920. He brought a broad culture and enthusiasm to the solution of agricultural problems, and was instrumental in the development of many economic projects. His immediate personal researches were chiefly along phytopathological lines, and he stimulated valuable work on the part of his associates.—*M. F. Warner.*

1764. [ROBERTS, J. W.] Dr. S. M. McMurran. *Amer. Nut. Jour.* **13**: 71. 1920.—Stockton Mosby McMurran, born March 8, 1887; died September 5, 1920. Several of his phytopathological articles are noted.—*M. F. Warner.*

1765. ROBERTS, W. American plants in England. *Gard. Chron.* **III**, **67**: 52. 1920.—Advertisements of seeds and plants, chiefly from newspapers. An anonymous communication in *Gentleman's Magazine*, Dec. 1751, is mentioned, concluding with *Seeds Arrived this Year from our North American Colonies*, an extensive list quoted in full, under vernacular names probably at that time in use in North America, comprising trees, ornamental shrubs, and vines. Particular mention is made of a 12-page catalogue of William Wright of Edinburgh, advertising American trees collected in Canada by his brother John, who was said to have previously printed at London a catalogue comprising nearly 600 different kinds; but this has not been traced. Other London seedsmen offering American plants and seeds are mentioned. The most popular plant imported seems to have been the American aloe.—*M. F. Warner.*

1766. ROBERTS, W. A forgotten botanical artist: Miss Crabtree. *Gard. Chron.* **III**, **67**: 278. 1920.—Drawings made in the 18th century by Philippa Crabtree, who may have been the child of this name, born to John and Philippa Crabtree, Nov. 17, 1764. She sent to the Royal Academy in 1786 and 1787 three exhibits entitled "Flowers from Nature." Query: Is it not likely that she drew some of the unsigned plates in early volumes of the *Botanical Magazine*? Drawings by MARY ANN and ELIZABETH CRABTREE, 1816 to 1822, are also noted.—*M. F. Warner.*

1767. ROBERTS, W. Some little known botanists. *Gard. Chron.* III, 65: 147. 1919.—Eighteenth century medical men, gleaned from Musgrave's Obituary, and either not found or incompletely treated in Britten and Boulger's Biographical Index of British and Irish Botanists, are mentioned. Considerable data are given on Thomas Clarke, prominent in Jamaica affairs from 1774 to his death in 1792; Edwin Sandys of Wadham College (died 1731?), Thomas Brisbane (died 1742), James Newton (died 1750), Richard Kentish (died 1792), and many others are mentioned.—*M. F. Warner.*

1768. ROPER, I. M. Edward Baylis's "Botanic Physic." (Bibliographical notes. LXX.) *Jour. Botany* 56: 52-54. 1918.—A quarto volume of 563 pages with 41 full-size copper plates of medicinal plants, by Edward Baylis M.D., issued in parts during 1791 and 1792. The work is very rare and no information about the author can be traced.—*Neil E. Stevens.*

1769. SCHENCK, HEINRICH. Martin Schongauer's Drachenbaum. [The dragon tree of Schongauer.] *Naturwiss. Wochenschr. N.F.*, 19: 775-780. 1 fig. 1920.—The dragon tree (*Dracaena Draco*) is found in a copperplate of the "Flight into Egypt" engraved by Martin Schongauer about 1469-1474, over 100 years before the first botanical description and illustration by Clusius. Schongauer could not have drawn his plant from a printed description, as earlier works do not treat of it, while the *Herbarius* (1484) and *Herbarium Apuleji Platonici* (1480) had not yet been printed; moreover, the accuracy of the drawing shows that it could only have been made from the living tree. Little is known of Schongauer's life, but he had probably visited southern Spain or Portugal, whither the dragon tree must have been brought by voyagers to the Canaries as early as the middle of the 14th century, as evidenced by very ancient specimens recorded from Cadiz and Lisbon. Schenck further shows that Schongauer's drawing is not only the earliest known representation of the dragon tree, but was evidently the prototype of those found in the work of Dürer, Burgmair, Bosch, Juppe, and Grüninger.—*M. F. Warner.*

1770. SCHIPS, M. Die Idee von Typus und ihre Bedeutung für Morphologie und Systematik. [The idea of "type" and its significance in morphology and taxonomy.] *Naturwiss. Wochenschr. N.F.*, 18: 401-407. 1919.—A discussion of the development of the 2 opposed philosophical conceptions of the "type," or model, on which living things were created. The realistic, which held that a material type existed and might be found; and the idealistic, which held that the "type" existed only in the mind of the creator. This has, of course, no reference to modern discussions of nomenclatorial type.—*Neil E. Stevens.*

1771. SCHUSTER, JULIUS. Die Dokumenten-Sammlung Darmstaedter der Preussischen Staatsbibliothek und ihre Bedeutung als historisches Archiv für Naturwissenschaften und Medizin. [The Darmstaedter document collection of the Prussian state library and its importance as source for the history of natural science and medicine.] *Naturwiss. Wochenschr. N.F.*, 19: 707-710. 1920.—Some of the more important sources to be found in this library are indicated and the importance of research in the history of science is emphasized.—*Neil E. Stevens.*

1772. S[COTT], D. H. Edward Alexander Newell Arber. *Proc. Linn. Soc. London* 131: 39-48. 1919.—Biographical sketch of Newell Arber (1870-1918), and outline of his scientific work with particular reference to paleobotany. A chronological list (1899-1918), prepared by his wife, of 82 books and papers is appended. [See also *Bot. Absts.* 8, Entry 1643.]—*M. F. Warner.*

1773. SCOTT, D. H. The late Ethel Sargent. *Jour. Botany* 56: 115-116. 1918.—Miss Sargent was distinguished for her researches in cytology and in the comparative anatomy of seedlings. [See also *Bot. Absts.* 5, Entry 72.]—*Neil E. Stevens.*

1774. SEWARD, A. C. Reginald Philip Gregory. *Nature* 102: 247-248. 1918.—R. P. Gregory (1879-1918) was a "good all-round botanist," whose contributions to the knowledge of the genetics and cytology of giant races of *Primula* were of special interest. [See also *Bot. Absts.* 5, Entry 1234; 8, Entry 830.]—*Neil E. Stevens.*

1775. S[KAN], S. A. **A. H. Hildebrand.** Roy. Bot. Gard. Kew Bull. Misc. Inform. 1918: 32-33. 1918.—Arthur Hedding Hildebrand, C.I.E., whose death at the age of 65 is announced in The Times of January 7, introduced a number of interesting plants to cultivation, among others the remarkable *Lonicera Hildebrandiana*. He also experimented with the cultivation of English roses and strawberries in Burma, where he spent over 30 years as administrator.—*M. F. Warner*.

1776. S[KAN], S. A. **Lady Barkly's drawings of orchids.** Roy. Bot. Gard. Kew Bull. Misc. Inform. 1918: 342. 1918.—A collection recently presented to the Kew herbarium, comprising 51 orchids of British Guiana, and 7 from Jamaica, drawn from nature by Lady Barkly while her husband, Sir Henry Barkly, was governor of British Guiana, 1848-53, and of Jamaica, 1853-56. She died at Melbourne, Apr. 17, 1857. The collection also includes 66 drawings of Cape plants, mostly drawn by her daughter, Miss E. B. Barkly.—*M. F. Warner*.

1777. SMITH, H. I. **James M. Macoun.** Science 51: 478-480. 1920.

1778. SPRENGER. **Karl Sprenger.** Mitteil. Deutsch. Dendrol. Ges. 27: 354-356. *Portrait*. [1918?].—Born in Schwerin. After the Franco-Prussian war he had gone to Italy, and developed a garden at Vomero, near Naples, whence he introduced and distributed plants from all over the world. He travelled extensively in Spain in search of choice plants, and wrote many botanical papers. He died at Corfu in December, 1917.—*M. F. Warner*.

1779. STEFFEN, ALEXANDER. **Aus der Geschichte der Garten-Aurikeln.** [Bits of Auricula history.] Gartenflora 69: 113-115. 1920.—The vogue of this flower toward the end of the 18th century is recalled, and Neuenhahn's Annalen der Gärtnerey, which was largely devoted to it, and F. A. Kanngiesser's Aurikelflora are mentioned.—*M. F. Warner*.

1780. STEVENS, N. E. **The botany of the New England poets.** Sci. Monthly 12: 137-149. 1921.—Quotations are given from Longfellow, Whittier, Emerson, Holmes, and Lowell, showing their knowledge of plants.—*L. Pace*.

1781. STOPES, M. C. **A new monthly botanical journal.** Sci. Prog. [London] 13: 457. 1919.—A brief statement is given regarding the inauguration and scope of Botanical Abstracts.—*J. L. Weimer*.

1782. SYDOW, H. **Ferdinand Theissen, S. J.** Ann. Mycol. 17: 134-139. 1919 [1920].—An appreciation, with brief biography, of Ferdinand Theissen (1877-1919). A bibliography of his 52 mycological contributions is appended.—*H. S. Jackson*.

1783. TEALL, GARDNER. **Collecting old-time garden books.** House and Garden 37: 34-35, 68. *Illus.* 1920.—Virgil, Crescenzi, early English authors such as Plat and Worlidge, Evelyn's Sylva, Kalendarium, and translation of La Quintinye, and the Scot's Gardner of John Reid are mentioned; also early American works, such as Totler's Almanac for South Carolina, 1752, with its garden calendar, Squibb's Gardener's Calendar, 1787, and John Allen's The Husbandman's Guide, Boston, 1712. Two of the illustrations are incorrectly labelled; the portrait of "Remberti," i.e., Rembert Dodoens, could not have appeared in a 15th century book, since Dodoens was born in 1517, while "Andreas Gerardus" is a fictitious name, possibly intended for John Gerarde, though the portrait is probably one of Matthiolum.—*M. F. Warner*.

1784. THAXTER, ROLAND. **William Gilson Farlow.** Amer. Jour. Sci. 49: 87-95. *Portrait*. 1920.—Doctor Farlow was born Dec. 17, 1844, died June 3, 1919. Since 1870 he held a position in Harvard University, the greater portion of the time as Professor of Cryptogamic Botany. The article contains the outstanding incidents of Doctor Farlow's life and an appreciation of his work. [See also Bot. Absts. 6, Entries 916, 947, 956, 963, 1463, 1470; 7, Entry 1593; 8 Entries 833, 1682, 1785.]—*T. J. Fitzpatrick*.

1785. THAXTER, ROLAND. William Gilson Farlow. *Bot. Gaz.* 69: 83-87. *Portrait*. 1920.—A biographic sketch. [See also preceding Entry.]—*H. C. Cowles.*

1786. THOMPSON, H. S. Curtis's Botanical magazine. Garden 83: 576. 1919.—The author concerns himself with discrepancies in dates of early volumes.—*Neil E. Stevens.*

1787. THORPE, T. E. Armand Gautier. *Nature* 106: 85-86. 1920.—Emile Justin Armand Gautier, distinguished for his investigations in many branches of chemistry, was known to botanists for his work in plant biochemistry, especially concerning the "chemical transformations of various products in the life-history of vegetable organisms."—*Neil E. Stevens.*

1788. TIMM, R. Zum achtzigsten Geburtstage Warnstorfs. [Warnstorf's eightieth birthday.] *Hedwigia* 60: 50-53. 1918.—An appreciation of the botanical work of Carl Warnstorf (born December 2, 1837) especially in the field of bryology.—*Neil E. Stevens.*

1789. TONI, G. B. DE. Commemorazione dei soci defunti G. Briosi e P. Baccarini. *Bull. Soc. Bot. Ital.* 1919: 59-62. 1919.—In memory of the deceased members Giovanni Briosi (1846-1919), and Pasquale Baccarini (1858-1919).—*Neil E. Stevens.*

1790. TONI, G. B. DE. [Lucio Gabelli.] *Bull. Soc. Bot. Ital.* 1918: 54-55. 1918.—Gabelli died Sept. 7, 1918. A brief note on his botanical work, most important being his study of the Gnetaceae.—*M. F. Warner.*

1791. TRAVERSO, G. B. Pier Andrea Saccardo. *Riv. Biol.* 2: 145-148. *Portrait*. 1920.—Saccardo was born April 23, 1845, died February 11, 1920. His work as a mycologist is outlined, and there is brief mention of his interest in botanical history, which resulted in such books as his *La Botanica in Italia* (2 Vol., 1895, 1902) and *La Cronologia della flora Italiana* (1909).—*M. F. Warner.*

1792. TRUE, R. H. Beginnings of agricultural literature in America. *Bull. Amer. Library Assoc.* 14: 186-194. 1920.—Some data are to be found in narratives of early European explorers, the voyage of Captains Amadas and Barlowe, and Peter Martyr's *Decades of the Newe World*; those of the first colonists, John Smith in Virginia, Bradford and Winthrop in Massachusetts, and for the French provinces the *Jesuit Relations*. To the succeeding period of colonial expansion and freer communication with Europe belong John Clayton's *Letter on Virginia* (1688), Josselyn's *Voyages*, Francis Moore's *Voyage to Georgia* (1744), and Kalm's *Travels into North America*. About this time began the first definitely agricultural publications, of which Jared Eliot's *Essay upon Field-Husbandry in New England* (1748), with its continuations, may be considered the most important American agricultural writing of the colonial period. Following the Revolution, a number of works of the most practical and experimental character were published by John Beale Bordley, and during this time also appeared Deane's *New England Farmer*, a typical agricultural dictionary. This was also the time of the rise of agricultural societies in South Carolina, Pennsylvania, Massachusetts and New York; their papers were at first usually printed in the newspapers, and the first volume from such a source was published by the Massachusetts Society for Promoting Agriculture in 1799. The first distinctly agricultural periodical in the country was the *Agricultural Museum* (Georgetown, D. C., 1810), while the *American Farmer* was founded by Skinner in 1819.—*M. F. Warner.*

1793. TURRILL, W. B. The Rev. H. F. Tozer and plants collected by him in the nearer East. *Roy. Bot. Gard. Kew Bull. Misc. Inform.* 1920: 29-31. 1920.—The Rev. H. F. Tozer was born in 1829 and died June 2, 1916. He travelled extensively, especially in Greece and the old Turkish Empire, and wrote many books and articles on these regions. Some of his plants, which have recently been presented to Kew, are from localities little known to botanists.—*M. F. Warner.*

1794. UNITED STATES. 66TH CONGRESS, 2D SESSION. JOINT COMMITTEE ON THE LIBRARY. Hearing on S. 497, a bill to increase the area of the United States botanic garden in the city of Washington, District of Columbia, and S. Res. 165, directing the committee on the District of Columbia to report plans for the creation in or near the District of Columbia of a botanic garden comparable with the best existing botanic gardens. Part 1-2. 58 + v + 59-152 p., 4 maps. Government Printing Office: Washington, 1920.—Part 1, Committee hearings, is devoted to testimony of experts on the requirements and possibilities of botanic gardens. Part 2 includes extracts from numerous publications on botanic gardens and their functions, a compilation of statistics in regard to existing gardens, and a list of references to literature on the subject, together with a history of the present garden in Washington.—*M. F. Warner.*

1795. VAUGHAN, JOHN. *The music of wild flowers.* 181 p. E. P. Dutton & Co.: New York, 1920.—A collection of essays, most of which have some bearing on the British local flora, but the 1st, which gives title to the volume, is on the recreation a number of distinguished men have found in field botanical study: The philosophers Rousseau and John Stuart Mill; the poets Gray, Crabbe, and Tennyson; Charles Kingsley; Prof. Hort, the Greek scholar; and Edward Cowell, professor of Sanskrit at Cambridge. The 2nd essay, *An Old Herbal*, describes the first edition of Fuchs' *History of Plants* (Basle, 1542), and especially the copy belonging to the library of Winchester Cathedral, in which the English names have been written beneath each plant, evidently by a competent botanist, and in all probability soon after the publication of the work. It is suggested that this copy of Fuchs may have originally been owned by John Warner, a prebendary of the Cathedral from 1549, Dean of Winchester from 1559 until his death in 1564, and a physician as well as a clergyman. His interest in botany is evident from the fact that 2 other botanical books in the Cathedral library contain his name.—*M. F. Warner.*

1796. VAUPEL, FRIEDRICH. *Aus der alten Kakteenliteratur.* *Monatsschr. Kakteenk.* 27: 83-85, 104-107, 113-116, 129-132, 141-146. 1917; 28: 53-54, 71-72, 105-108, 124-126, 136-138. 1918; 29: 25-31, 49-54, 61-66, 115-120, 127-128, 140-144. 1919.—Reprints of diagnoses, descriptions of plates, and a few other notes from the following: Salm-Dyck, *Observationes botanicae in horto Dickensi notatae* (1822); Candolle, *Catalogus plantarum horti botanici Monspeliensis* (1813); Plumier, *Plantarum americanarum fasciculus octavus* (1758); Oviedo, *Coronica delas Indias*; Lobel, *Plantarum seu stirpium historia*; Mattioli, *Commentarii in sex libros Pedacii Dioscoridis Anazarbei de medica materia*; Acosta, *Historia natural y moral de las Indias*.—*M. F. Warner.*

1797. VUILLEMIN, PAUL. Émile Boudier (1828-1920)—Pier Andrea Saccardo (1845-1920). *Rev. Gén. Sci. Pures et Appl.* 31: 233-234. 1920.—The deaths of 2 great leaders in mycology are recorded.—*M. F. Warner.*

1798. WARNER, H. H. *A garden in the sixteenth century.* *Garden* 84: 321. 1920.—Garden of the rectory in the little village of Bishopsbourne near Canterbury, which remains today very much as "the learned and judicious" Richard Hooker, rector from 1595 to 1600, made it.—*M. F. Warner.*

1799. WARNER, H. H. *Shakespeare and the garden.* *Garden* 84: 406-407. *Fig.* 1920.—Chiefly quotations from Shakespeare relating to flowers and gardens; the number of plants mentioned by him is said to be about 150.—*M. F. Warner.*

1800. WARNER, M. F. *Exostemma Sanctae Luciae.* *Jour. Botany* 56: 55. 1918.—A communication read before the American Philosophical Society February 20, 1784, though not printed until 1786, includes a popular description of the plant by George Davidson, under the name *Cinchona Caribaea Sanctae Luciae*.—*Neil E. Stevens.*

1801. WARNER, M. F. *The literature of horticulture.* *Library Jour.* 44: 766-776. 1919.—Paper presented at Agricultural Libraries Section, American Library Association, Asbury

Park, June 26, 1919, under title: Bibliographical Opportunities in Horticulture. [See Bot. Absts. 8, Entry 918.]-*Neil E. Stevens.*

1802. WARNER, M. F. *A Virginia garden in 1774.* Jour. Internat. Garden Club 3: 191-195. 1919.—Extracted with running comment from the diary of PHILIP VICKERS FITHIAN, while tutor at Nomini Hall, Westmoreland County, Virginia. His observations on garden plants and operations, and miscellaneous details of agricultural practice in that locality, together with some notes on climate and times of flowering and fruiting are covered.—*M. F. Warner.*

1803. WHETZEL, H. H. *George Francis Atkinson.* Guide to Nature 12: 70-72. *Portrait.* 1919.—Popular account of Atkinson as mycologist.—*Neil E. Stevens.*

1804. WHETZEL, H. H., and H. B. HUMPHREY. *Frederick Kølpin Ravn.* Phytopathology 11: 1-5. *Portrait.* 1921.—A brief biographical sketch and appreciation.—*B. B. Higgins.*

1805. WILCOX, E. M. *Harvey Elmer Vasey.* Phytopathology 9: 299-300. *Portrait.* 1919.—A sketch of H. E. Vasey (1890-1918).—*Neil E. Stevens.*

1806. W[ILLIS], J. C. *Dr. Alberto Löfgren.* Proc. Linn. Soc. London 131: 57-58. 1919.—He was born in Stockholm Sept. 1854, and studied at the University of Upsala, but accompanying the Regnell expedition to southern Brazil in 1874, he remained in that country all his life, dying at Rio de Janeiro Aug. 30, 1918. His publications are comparatively few, though he had the most complete knowledge of the Brazilian flora of any botanist of his time. His collections are mostly at Sao Paulo and at Rio de Janeiro, with duplicates at Copenhagen, Stockholm, Berlin, and the Glaziou collection.—*M. F. Warner.*

1807. WILSON, W. F. *David Douglas, botanist at Hawaii.* 83 p., illus. (including portraits). Honolulu, 1919.—Reprint of various materials relating to Douglas (1798-1834).—*Neil E. Stevens.*

1808. WOODRUFF, L. L. *History of biology.* Sci. Monthly 12: 253-281. 1921.—Biology as the science of life really had its beginnings with the Greeks. Aristotle, Theophrastus, Hippocrates, Dioscorides, Pliny, van Leeuwenhoek, Malpighi, Grew, Linnaeus, Harvey, Cuvier, Huxley, Agassiz, Weismann, Mendel, Darwin, Gray, and many others are characterized in a few incisive statements.—*L. Pace.*

1809. ZIRPOLO, G. *Michele Geremicca.* Riv. Biol. 2: 704-706. *Portrait.* 1920.—An outline of the life and botanical work of Geremicca, who was born in Naples Nov. 9, 1857, and died there June 17, 1920. He published many works, chiefly on morphology and physiology, and was also greatly interested in the history of Italian botanists, publishing in the *Bullettino della Società dei Naturalisti* a few chapters of a systematic index to botanical literature.—*M. F. Warner.*

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ALFRED GUNDERSEN, *Assistant Editor*

(See also in this issue Entries 1892, 1926, 2141, 2231)

1810. ANONYMOUS. *Museums in education.* Nature 106: 269-270. 1920.—An editorial on the Final Report of Committee, British Association, Section L (Cardiff, 1920). The suggestion is endorsed that there be a central council to aid in the inception of museums and to coordinate their work when established.—*O. A. Stevens.*

1811. ANONYMOUS. *Programma onderwijs Rijksbloembollenschool.* [Educational program of the Government bulb school.] Weekbl. Bloembollenacult. 30: 120. 1919.—The course

occupies 3 years. The main object is to develop horticulturists especially trained in bulb raising. The school is located at Lisse, Netherlands.—*J. C. Th. Uphof*.

1812. ANONYMOUS. [Rev. of: COULTER, J. M., and M. C. COULTER. *Plant genetics*. ix + 214 p. The University of Chicago Press: Chicago, 1918 (see Bot. Absts. 2, Entry 395).] *Sci. Prog.* [London] 13: 502-504. 1919.

1813. ANONYMOUS. [Rev. of: GAGER, C. S. *Fundamentals of Botany*. xix + 640 p. P. Blakiston's Son & Co.: Philadelphia, 1916, Reprinted, 1917.] *Sci. Prog.* [London] 13: 504-505. 1919.

1814. ANONYMOUS. [Rev. of English translation, by LIVINGSTON, B. E., of: PALLADIN, V. I. *Pflanzen-Physiologie*. (Plant Physiology.) xxv + 320 p. P. Blakiston's Son & Co.: Philadelphia, 1918.] *Sci. Prog.* [London] 13: 502. 1919.

1815. ANONYMOUS. [Rev. of: ROBBINS, W. W. *The botany of crop plants*. xx + 681 p. 263 fig. P. Blakiston's Son & Co.: Philadelphia, 1917.] *Sci. Prog.* [London] 13: 676-677 1919.

1816. ANONYMOUS. [Rev. of: WHITING, A. L. *Soil biology laboratory manual*. x + 143 p. John Wiley & Sons: New York; Chapman & Hall, Ltd.: London, 1917.] *Sci. Prog.* [London] 13: 505. 1919.

1817. CLUTE, WILLARD N. *Plant names and their meanings*—V. *Amer. Bot.* 27: 18-23. 1921.—The derivation of scientific and vernacular names of the Liliaceae is discussed.—*S. P. Nichols*.

1818. HELLAND-HANSEN, BJÖRN. *Den biologiske station*. [The biological station.] Bergens Mus. Aarsberetning 1918-1919: 76-77. 1919.—Annual report of activities and publications.—*A. Gundersen*.

1819. KREUTZER, E. *Zur forstlichen Hochschulfrage in der Tschecho-Slowakei*. [The question of forest colleges in Czecho-Slovakia.] *Allg. Forst- u. Jagd-zeitg.* [Wien] 38: 148-149. 1920.—The establishment of one or more agricultural colleges in Czecho-Slovakia is being considered. This leads to a discussion of forestry education in general in the old Austrian Empire and its present tendencies in the component states. In general there seems to be a tendency to start more schools than the small size of the states warrants.—*F. S. Baker*.

1820. KTK. *Der deutsche forstliche Hochschulunterricht in der Tschecho-Slowakei*. [The German forestry college instruction in Czecho-Slovakia.] *Wiener Allg. Forst- u. Jagd-zeitg.* 38: 190-191. 1920.—The German Section of the Agricultural Council for Bohemia has a project under consideration for the establishment of a forestry college in Czecho-Slovakia. There are 3 alternatives: (1) Establishment of a new school; (2) establishment of a forestry branch of some technical college, perhaps at Prague or Brunn; (3) transformation of the Higher Forest Academy at Reichstadt. The 1st plan gives the most freedom of choice as to location, etc., but is expensive. The 2nd is inexpensive and has the advantage that a portion of the faculty is already furnished; but the location in a big city is undesirable. The 3rd plan has been adopted and presented to the government. It calls for the taking over of the Reichstadt Academy, the latter to be established as an independent branch of the Prague Technical College.—*F. S. Baker*.

1821. MARTIN, JOHN N. *Botany with agricultural applications*. 2nd ed. revised, xii + 604 p., 490 fig. John Wiley & Sons, Inc.: New York, 1920.—Full title of 1st edition is "Botany for agricultural students." Much of the text is rewritten, and new and additional illustrations are used. An additional chapter on "Variations" is included. [See Bot. Absts. 3, Entries, 1920, 2165].—*C. S. Gager*.

1822. NEEDHAM, J. G. The new wild life preserve near McLean, N. Y. *Sci. Monthly* 12: 246-252. *Fig. 1-2.* 1921.—This bog, 15 miles from Cornell University and always the object of interest and study, has recently been made into a wild life preserve and placed in the keeping of the Trustees of the Lloyd Library. A professor from one of the biological departments of Cornell University is to be custodian. The author has been designated as the first custodian. The preserve is an uncultivated area of about 100 acres. The 2 maps show the roads and houses in the vicinity, the topography, and the character of the vegetation. A fence to keep out grazing animals and signs inviting naturalists to enter for study but not for destruction are the protective measures adopted.—*L. Pace.*

1823. STEBBING, E. P. Higher forestry education for the empire. *Nature* 106: 438-440. 1920.—Discussion, relating chiefly to India, as to whether forest probationers should be trained at one central institution.—*O. A. Stevens.*

1824. VOLKEROZ, K. De opleiding tot vakondernijns in de bloembollenteelt en het tuinbou-wondernijns in de bloembollenstreek. [Professional training in bulb culture and horticultural education in the bulb district.] *Weekbl. Bloembollencult.* 30: 46-47. 1919.—A general outline is given of the horticultural education of the Government Horticultural Winter Schools and the Government Horticultural Winter Courses, especially with reference to the bulb-growing districts of the Netherlands. Winter courses (short courses) in the bulb districts are given in Bennebroek, Hillegom, Lisse, Sassenheim, and Noordwijk. A winter school is established at Lisse, also a course to train horticultural teachers in bulb raising. In the winter courses, 5 subjects are taught; in the winter schools 20 subjects, among them the English, German, and Russian languages. The winter schools and winter courses have 1768 and 300 lecture hours respectively; both courses extend over 2 years.—*J. C. Th. Uphof.*

1825. WEATHERBY, C. A. What the Latin names mean—I. *Amer. Fern Jour.* 10: 113-115. 1920.—The article consists of a list of 41 specific names, beginning with *acrostichoides* and extending through *frondosa*, with origin and meaning of each.—*F. C. Anderson.*

CYTOLOGY

GILBERT M. SMITH, *Editor*

GEO. S. BRYAN, *Assistant Editor*

(See also in this issue Entries 1904, 1945, 1946, 2148, 2195)

1826. BAILEY, I. W. The cambium and its derivative tissues. III. A reconnaissance of cytological phenomena in the cambium. *Amer. Jour. Bot.* 7: 417-434. 4 *pl.* 1920.—The elements of the cambium in gymnosperms and angiosperms, although they may attain a very great length (9,000 microns), are uninucleate. The sphere of influence of the nucleus must, therefore, sometimes extend for several thousand microns. The nucleo-cytoplasmic ratio in cambial initials may vary greatly but in *Pinus Strobus*, at least, the chromosome number is always constant; and in all material examined chromosome size is also essentially constant. WINKLER's conclusion that there is a close correlation between cell size and chromosomal mass evidently does not hold for the cambium. The fusiform cambial initials, which are frequently several hundred times as long as they are wide, divide longitudinally in the tangential plane, the continual increase in the periphery of the cambium not being met by radial divisions but by the cells sliding by one another. The longitudinal division takes place through an extraordinary extension of the cell plate. The spindle fibers thicken between the daughter nuclei after mitosis, producing a cell plate, and this plate is extended upward and downward from the region of the nuclei through the operation of two masses of kinoplasmic fibrillae, the kinoplasmasomes, the new wall ultimately reaching both ends of the protoplast. The author discusses the types of cell plate formation described by various authors and believes that they represent different phases or stages of a single fundamental type of cytokinesis. The significance of the cambium in the investigation of various cyto-

logical problems, particularly of those relating to the cell plate and the dynamics of cytokinesis, is briefly discussed.—*E. W. Sinnott.*

1827. BEZSSONOF, N. Erscheinungen beim Wachstum von Mikroorganismen auf stark rohrzuckerhaltigen Nährboden und die Chondriomfrage. [Phenomena occurring in the growth of microorganisms on media of high cane-sugar content and the chondriosome question.] Centralbl. Bakt. II Abt. 50: 444-464. Pl. 1. 1920.—Molds cultivated on media with high cane-sugar content reacted, from a morphological point of view, as follows: The *Aspergillus* forms, *Penicillium glaucum* Bref. (Link), *Aspergillus Oryzae*, *A. candidus*, and *A. Wentii* produce fruiting bodies in the form of incipient perithecia. *A. Wentii* differs from the others in the shape of its ascogone and in this respect approaches the characteristic type of the Erysiphaceae. *Penicillium glaucum* produces giant conidia. *P. brevicaulis*, with its characteristic mycelium, deviates further from the others in its poor growth on cane-sugar media. *Rhizopus nigricans* produces zygosporangia, azygosporangia, and chlamydospores in cane-sugar solutions; sporangia were observed only on solid media.—The following physiological and cytological observations were made: *Aspergillus Oryzae* produces true alcoholic fermentation. The formation of ethyl alcohol was demonstrated both quantitatively and qualitatively. The fungi show fine granulation of the cytoplasm even in unstained material. Bacteria and fungi stain more intensely with nuclear stains because of the dispersion of the chromatin material. The accentuated development of generative cells, on media with high sugar concentration, the dispersed condition of the cytoplasmic units as well as the state of dispersion of the chondriosomes points to an intimate relation between these phenomena.—*Anthony Berg.*

1828. COWDREY, N. H. Experimental studies on mitochondria in plant cells. Biol. Bull. [Woods Hole] 39: 188-200. 3 pl. 1920.—The author has conducted experiments on the radicles of seedling peas to determine whether mitochondria might be utilized as cytological indicators of cell activity. The conclusion is that "mitochondria are changed to an abnormal degree only under severe conditions which either kill the cell or render its recovery very improbable."—*Elda R. Walker.*

1829. DANGEARD, P. A. Observations relatives à la note précédente. [Observations regarding an earlier communication.] Compt. Rend. Acad. Sci. Paris 170: 1518. 1920.—Reference is made to the controversy between GUILLIERMOND and the author. The latter states that he still maintains his former contentions, but has nothing further to add at this time.—*C. H. Farr.*

1830. DANGEARD, P. A. Sur la métachromatine et les composés tanniques des vacuoles. [On the metachromatin and the tannin content of the vacuoles.] Compt. Rend. Acad. Sci. Paris 171: 1016-1019. 9 fig. 1920.—A study of the vacuoles of *Taxus baccata* and the effects of intravital stains indicate that the vacuoles are formed in association with metachromatin and that this material is distinct from the tannin bodies which are formed later.—*C. H. Farr.*

1831. EMBERGER, L. Étude cytologique de la Sélaginelle. [A cytological study of Selaginella.] Compt. Rend. Acad. Sci. Paris 171: 263-266. Fig. 1-6. 1920.—In the meristem and sporogenous tissues of *Selaginella* there are mitochondria of all types; plastids (one in each spore), microsomes of a lipid nature, and a vacuolar system of unknown constitution but similar to the metachromatin of fungi. The author differs with DANGEARD on his interpretation of these bodies.—*C. H. Farr.*

1832. GUILLIERMOND, A. Nouvelles observations cytologiques sur Saprolegnia. [New observations on the cytology of Saprolegnia.] Compt. Rend. Acad. Sci. Paris 171: 266-268. Fig. 1-6. 1920.—Vacuoles are found to be formed by the fusion of anastomosing canals. The fungus contains chondriosomes, fatty globules, and a vacuolar system which is not metachromatic in nature. Author finds that it is very difficult to distinguish the chondriosomes from the bacteria which are associated with the fungus.—*C. H. Farr.*

1833. GUILLIERMOND, A. *Nouvelles recherches sur l'appareil vacuolaire dans les végétaux.* [New investigations of the vacuolar system of plants.] *Compt. Rend. Acad. Sci. Paris* 171: 1071-1074. 25 fig. 1920.—Using the roots of beans and peas and the radicles of barley to trace the development of the vacuoles, the author concludes that the latter are formed from bodies which resemble mitochondria but are not true mitochondria.—*C. H. Farr.*

1834. GUILLIERMOND, A. *Sur l'évolution du chondriome pendant la formation des grains de pollen de Lilium candidum.* [The transformations of the chondriosome during formation of pollen grains of *Lilium candidum*.] *Compt. Rend. Acad. Sci. Paris* 170: 1003-1006. Fig. 1-11. 1920.—Chondriosomes in presynapsis consist of granular mitochondria, rods, and chondriocents. During synapsis numerous small granules and a few large granules appear. The latter enlarge and become darker during diakinesis. In metaphase and during the homeotypic division, rods and chondriocents are present. During microspore formation there are small granules and large plastids that become very distinct in the later stages.—*C. H. Farr.*

1835. HERRERA, A. L. *Sur l'imitation des cellules, des tissus, de la division cellulaire et de la structure du protoplasma avec le fluorosilicate de calcium.* [On the imitation of cells, tissues, cell-division, and the structure of protoplasm with calcium fluorsilicate.] *Compt. Rend. Acad. Sci. Paris* 170: 1613-1614. 1920.—A confirmation of the results of GAUTIER and CLAUSMANN on the biological importance of fluorine. Structures resembling cells are produced by the diffusion of KHF_2 and CaCl_2 into an alkaline solution of colloidal silica.—*C. H. Farr.*

1836. SHARP, L. W. *Mitosis in Osmunda.* [Rev. of: DIGBY, L. *On the archesporial and meiotic phases of Osmunda.* *Ann. Botany* 33: 135-172. 5 pl. 1919 (see Bot. Absts. 3, Entry 1933).] *Bot. Gaz.* 69: 88-91. 1920.—This paper is regarded as a very complete statement of the FARMER theory of the method of chromosome reduction, but it is felt that the figures fail to prove the theory advocated.—*H. C. Cowles.*

1837. WAGER, HAROLD. *Presidential address. The significance of sex and nuclear fusions in the fungi.* *Trans. British Mycol. Soc.* 6: 305-317. 1920.—The introduction to this address includes brief references to THOMAS GIBBS, SIR CHARLES THOMAS DYKE ACLAND, DR. ARTHUR ECKLEY LECHMERE, CHARLES OGILVIE FARQUHARSON, and ANTHONY WALLIS, mycologists who died during the year. A historical résumé of the development of knowledge concerning sex and nuclear fusions in fungi is given. Normal sexual fusion includes at least 2 phenomena, the blending of 2 distinct lines of descent, and rejuvenescence of the reproductive cell by means of which it receives a new stimulus to growth and division. In the higher fungi the blending of 2 lines of descent seems to have become superfluous and a simple type of nuclear fusion concerned only with rejuvenescence is taking the place of the more complex process of binary sexual fusion.—*W. B. McDougall.*

ECOLOGY AND PLANT GEOGRAPHY

H. C. COWLES, *Editor*

G. D. FULLER, *Assistant Editor*

(See in this issue Entries 1604, 1851, 1858, 1970, 2014, 2027, 2028, 2029, 2036, 2037, 2038, 2047, 2078, 2079, 2080, 2227, 2230, 2231, 2232)

FOREST BOTANY AND FORESTRY

RAPHAEL ZON, *Editor*J. V. HOFMANN, *Assistant Editor*

(See in this issue Entries 1819, 1820, 1823, 2009, 2010, 2011, 2105, 2107, 2109, 2121, 2123, 2124, 2187, 2227, 2234)

1838. ANONYMOUS. Departmental exploitation in the western Himalayas. *Indian Forester* 47: 1-11. 1921.

1839. ANONYMOUS. Forest Service. *Sci. Monthly* 12: 287. 1921.—This is a summary of Chief [U. S. A.] Forester W. B. GREELY's annual report.—*L. Pace*.

1840. ANONYMOUS. [Rev. of: HOWARD, A. L. *A manual of the timbers of the world, their characteristics and uses.* xvi + 446 p., 128 illus. Macmillan & Co.: London, 1920.] *Sci. Prog.* [London] 15: 499-500. 1921.

1841. BEESON, C. F. C. Food plants of Indian forest insects, Part V. *Indian Forester* 47: 21-25. 1921.—A continuation of previous work, the present compilation listing 25 insects which feed upon a variety of forest trees and shrubs.—*E. N. Munns*.

1842. BEESON, C. F. C. *Hoplocerambyx* and the dying off of sal. *Indian Forester* 47: 68-77. 1 fig. 1921.—A marked parallelism exists between the number of dead trees per year and the annual amount of rainfall; in abnormally wet years the number of sal dying is greatly increased, in abnormally dry years the number is very markedly decreased. The emergence period of the sal borer (*H. spinicornis*) is directly influenced by the initial date and extent of the rains through their effect on the moisture content of the heartwood of the sal and the relative humidity of the pupal chamber. In a wet year 75 per cent of the beetles emerge in the 1st month of the rains; in a dry year the period is prolonged nearly 2 months. The wet year increases the damage to sal by bad aeration through a rise in the water table, especially on heavier soils. This weakening renders the tree much more susceptible to the borer attacks, the borer acting as a secondary factor.—Control measures during an epidemic call for the removal from the forest before the end of April of all attacked parts of trees down to 18 inches girth in normal years and the removal of all parts of trees down to 12 inches girth in years of early and abundant precipitation. Removal of dead and dying trees on which the foliage is turning brown and trees with green foliage but with an abundant ejection of wood dust is indicated.—*E. N. Munns*.

1843. BENNETT, H. C. Experiments in sowing seeds of *Cassia auriculata* at Golla, Anantapur. *Indian Forester* 47: 25-29. 1921.—Six methods of seed sowing have been tried, each on 5 acres. Sowing in furrows gives the cheapest successful result, but plowing, hoeing, and harrowing give the best results.—*E. N. Munns*.

1844. BROWN, N. C. Vallombrosa forest in Italy. *Amer. Forestry* 26: 647-654. 15 fig. 1920.—The forest consists of 3500 acres, 875 acres chestnut and 125 acres containing 3 varieties of Italian pines. The remainder is made up of European beech (*Fagus sylvatica*) and silver fir (*Abies pectinata*). The forest has been under continuous management by Italian forestry officials since 1869, and for centuries before that date by the monks.—*Chas. H. Otis*.

1845. BUTLER, O. M. Forest conservation by better utilization. *Amer. Forestry* 26: 682-683, 691. 1920.

1846. CHAYTOR, A. H. Planting Douglas fir and Sitka spruce in cleared coppice. *Quart. Jour. Forest.* 14: 161-164. 1920.—Plantations of Douglas fir, Sitka spruce, and Japanese larch set out in old coppice woods at Iridge Place, Hurst Green, Sussex, England, from the years 1910 to 1913, were tended very carefully previous to the war, the rubbish and coppice

being cleared each year from around each tree; owing to the absence of woodsmen and keepers the trees were allowed to shift for themselves during the war. Under the latter condition the Douglas fir and Sitka spruce have thrived fully as well or better than under the former treatment. The larches have not been so successful under neglect, because where completely overtopped they have often died back at the tip or succumbed outright. Except where the tops have been whipped by the underwood, Douglas fir and Sitka spruce are in perfect health although completely covered by coppice. All that is required is the removal of overhead branches that will interfere with the growth of the leading shoot; to do more seems a waste of labor and money. During the war rabbits killed many larches but did little damage to Douglas fir or Sitka spruce. The fir and spruce, even up to 5 and 6 ft. high, transplant well if moved in autumn with a ball of earth. A spacing of 9 by 9 feet is advocated for Douglas fir in strong coppice.—*C. R. Tillotson.*

1847. CRAFT, Q. R. Timber conservation in Wyoming. *Amer. Forestry* 26: 740-741. 2 fig. 1920.

1848. GESCHWIND. Aus der Praxis der Saatschuldüngung im bosnisch-herzegovinischen Karstgebiete. [The practice of nursery fertilizing in the Karst region, Bosnia-Herzegovina.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 201-203. 1920.—Forest tree nurseries in the Karst (devoted to *Pinus austriaca*) are usually far from railroads. The soil is scanty and poor, and the nursery is soon in need of fertilizer not only to add the necessary chemical elements but to improve the physical condition of the soil as well. Owing to the difficulty of bringing in bulky fertilizers local sod has been used for some time with success by the writer. This is cut 14 × 50 cm. to fit between the seed rows (18 cm.) and placed grassy side down. It prevents compacting of the soil and discourages the growth of weeds; and as it rots (2 years) it enriches the soil. Small pieces of sod are gathered in heaps and covered with sod making in 2 years a rich compost that is spread between the rows after weeding.—The stock is grown for 2 years; after removal the remainder of the sod is turned in, the area reseeded and the space between the rows again sodded.—Soil collecting in holes in the limestone cliffs, a mixture of dust, lime fragments, mosses, algae, and bird and animal droppings, has also proved successful in maintaining the fertility of these nurseries.—*F. S. Baker.*

1849. GESCHWIND. Die Hasenschäden in den Schwarzkiefern-kulturen des Karstes. [Rabbit damage in Austrian pine plantations of the Karst.] *Allg. Forst- u. Jagd-Zeitg.* [Wien] 38: 159-160. 1920.—Rabbit damage is severe in plantations of Austrian pine (*Pinus austriaca*) in the Karst region of Bosnia-Herzegovina for a period of about 5 years after planting. Two-year old seedlings are planted in deep holes and a depression is left around the stem to catch water. This, with a circling wall of stones, enables rabbits to reach the tops for some years. The greatest damage occurs the 1st winter after planting and in regions where the tree is being newly introduced. The rabbits do not appear to eat the pines as food, as the injury is found when other food is abundant; the uneaten top is often found near the plant.—Recovery is more general than in other regions as the rainfall and temperature produce a long favorable growing season. Trees usually recover in 3-4 years, unless the terminal is eaten off before side buds are formed (at 3-4 years of age). Adventitious buds rarely develop under these circumstances. Such trees are replaced immediately while others are left to recover, as they usually do if well rooted. Hunting out the rabbits in fenced and cultivated places is the best way of combating the evil.—*F. S. Baker.*

1850. GESCHWIND. Der plenter- oder femelwaldartige Niederwald. [The coppice selection forest.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 237-238. 1920.—The selection form of coppice forest seems never to have been definitely described although it is very common throughout the Balkan peninsula and is found in parts of Switzerland. Any coppice forest will assume a somewhat uneven-aged form since sprouting is not limited to any one year, although the oldest age class will predominate; especially in southern (warm) climates, where sprouting tends to continue more or less through the entire rotation, the appearance of the stand is not even-aged but of a selection form. Under the undeveloped forestry systems of

the Balkans such stands are managed under a rough selection system. The sprouts suffer much less from grazing damage, wind and snow breakage, and dryness than when clean cut; but due to light deficiency there is poorer development, and suppression may ultimately lead to bad openings in the stands. Felling is very much more difficult than when a clean-cutting method is used as the stands are dense and trees lodge badly. The author does not advocate the method, merely describes it, but presumes that it is much better adapted to southern countries than to those farther north, since sprouting under deficient light is much better in the south.—*F. S. Baker.*

1851. GREENFIELD, W. P. The sand-dunes of the Lincolnshire coast. *Quart. Jour. Forest.* 14: 176-184. 1920.—A general discussion of the sand dunes of the region and a plan for their reclamation. Afforestation cannot be considered as an actual means of sea-defense but should be a secondary operation following the fixing of the sand by means of the marram grass. Corsican pine at Holkham in Norfolk has proved the best species for planting on open parts exposed to sea breezes. In growth and hardihood, it far surpassed the Scotch and maritime pines.—*C. R. Tillotson.*

1852. GUTHRIE, J. D. The national forest resources of Alaska are for use. *Amer. Forestry* 27: 12-14. 5 fig. 1921.

1853. HARTEL, O. Ist die Wildbachverbauung notwendig? [Is control of torrents necessary?] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 171-172. 1920.—This question is treated under two heads: (1) How far is the great expense of torrent control economically justified, and (2) can poverty-stricken Austria afford the luxury of this control? The author shows that reforestation, protection, and careful regulation of the use of the watersheds, where the streams are small, helps greatly in ameliorating conditions in the main channels. Expensive engineering works have in the past been constructed in some places where only full protection of the upper slopes was needed. The work of the forester is inexpensive and can be carried on generally; expensive engineering works can be constructed if needed, following protection of the headwaters. Secondly, the author shows that Austria must control torrents both in view of hydro-electric developments and agriculture in the valleys.—*F. S. Baker.*

1854. HEADLEY, R. Fire protection to save our forests. *Amer. forestry* 26: 710-714. 4 fig. 1920.

1855. HENKEL, J. S. Forestry in Rhodesia. Improvement fellings on the farm. *Rhodesia Agric. Jour.* 18: 76-79. 1921.

1856. HENKEL, J. S. Forestry in Rhodesia. The management of woods. *Rhodesia Agric. Jour.* 17: 406-411. 1920.

1857. HENRY, AUGUSTINE. The artificial production of vigorous trees by hybridisation. *Quart. Jour. Forest.* 14: 253-257. 1920.—First generation hybrids in trees as in other plants are remarkable for their size, rapid growth, early and free flowering, ease with which they can be multiplied, and, in all probability, their comparative immunity to disease. The slow growth of the ordinary species of oak, ash, and walnut, except on the best agricultural soils, renders hopeless all possibility of an adequate financial return. Without vigorous 1st generation hybrids, the most valuable classes of timber can be grown only in limited quantity. There is the possibility of obtaining vigorous hybrids of the valuable species capable of thriving on soils ordinarily inhospitable. The relation of vigor in hybrids to the degree of relationship between the parents is unknown but of practical interest in the selection of parents for crossing experiments. Very little has been done in hybridization of forest trees. KLOTZSCH carried on experiments in 1845, at Berlin, with pine, oak, alder, and elm, and after 8 years the hybrids averaged $\frac{1}{2}$ larger than the parents. BURBANK's work with walnut in California has resulted in progeny of greater vigor. The author has produced a very vigorous hybrid, *Populus generosa*. Experiments carried out at Kew during the war with *Fraxinus excelsior*,

F. americana, *F. pennsylvanica*, and *F. oregona* resulted in progeny in nowise different from the carpellate parent. The author believes the artificial production of hybrid trees should be taken up seriously through the establishment of a research station, either in France or in the U. S. A.—*C. R. Tillotson*.

1858. HOOD, CONSTANCE C., AND MURIEL I. BACON. *Forestry in Morocco*. Quart. Jour. Forest. 14: 165-169. 1920.—Contrary to a commonly accepted idea, Morocco is not a desert country. The whole forest area may be divided into 3 zones. The 1st comprises the Forest of Marmora of 325,000 acres; it is open and without underwood. The species are cork-oak, Arar (*Thuya quadrivalvia*), and wild pear. The cork-oak makes this forest of especial interest and importance, it being the largest known forest of this species; the trees appear to flourish better here than in any other region, and the bark can be removed every 8 years (as compared with 13 years in the south of France), being then over an inch in thickness.—The 2nd zone covers a very large area, at present practically unsurveyed, extending over the Anti-Atlas regions. The species are cork-oak, maritime pine, cedar, juniper, yew, and maple. Large tracts of *Ilex* yield an excellent timber especially suitable for railroad ties. For the most part, the cedar grows pure and produces magnificent timber. Cedars 300-400 years old are 35-40 m. high and 5-6 m. in girth. These forests represent an enormous reserve awaiting future exploitation.—The 3rd zone is found in the south, in the Mogador-Agadir district, and comprises 1,250,000 acres. The soil is generally poor, varying from almost pure sand in the coast regions to calcareous in the extreme easterly portions. The prevailing species is the Argan (*Argania sideroxylon*), of peculiar botanical interest because of its very limited distribution. The wood is very hard, heavy (sinks in water), and makes excellent charcoal. The first yields Argan oil, an important article of food in southern Morocco. In this region also juniper and Arar occur. The latter species provided the material for the celebrated Roman tables of "mottled wood;" it is also tapped for resin.—There has been considerable activity in planting trees for ornamental purposes. The trees used chiefly for this purpose are eucalyptus, mulberry, sycamore, Aleppo pine, Bella Ombra, and poplar.—*C. R. Tillotson*.

1859. HRP. *Zur Reform der Staatsforstverwaltung in Oesterreich*. [Reform of the state forest administration in Austria.] Allg. Forst- u. Jagd-Zeitg. [Wien] 38: 87-88. 1920.—For a long time there has been a movement on foot among Austrian foresters to place technical foresters in the highest administrative offices in place of the jurists, who now occupy such positions. There are a number of indications (spring 1920) that the foresters have at last won their point.—*F. S. Baker*.

1860. KAY, JAMES. *Notes on jack pines and Sitka spruce*. Trans. Roy. Scottish Arboric. Soc. 34: 149-155. 1920.—Botanical and silvical descriptions of *Pinus divaricata* (*P. banksiana*), *P. contorta*, *P. contorta* var. *murrayana*, and *Picea sitchensis*.—*C. R. Tillotson*.

1861. L., F., UND K. V. *Zum Entwurfe eines neuen Forst-Servituten Gesetzes*. [Plans for a new forest servitude law.] Allg. Forst- u. Jagd-Zeitg. [Wien] 38: 135-137. 1920.—Two separate articles under one title.—F. L. points out the harm of the present system of servitudes dating from 1853. As originally given out they permitted the use of only a fraction of the total wood product, and much wood was left over in the forest to go to waste. Now, however, they seriously embarrass the proper exploitation of the forests, since all holders of rights take the maximum allowance whether they use it personally or not, selling any surplus. Furthermore, the servitude gives a right to 70 per cent firewood and 30 per cent sawtimber, whereas the forest is actually producing about 70 per cent sawtimber and 30 per cent firewood. The deficiency necessitates the giving of sawtimber for use as firewood. The opinion that the servitudes ought to be changed is general; the holders of rights desire further extension, while foresters and others favor limitation.—K. V. desires a change in the servitudes in the interests of uniformity as they are quite variable in different parts of Austria. He regards them as a part of the rights of the people under a republican form of government, and would have them extended.—*F. S. Baker*.

1862. LAMB, G. N. **American grown cork.** *Amer. Forestry* 27: 15-16. 5 fig. 1921.

1863. LAPEYRERE, M. E. **The Landes of Gascony.** *Trans. Roy. Scottish Arboric. Soc.* 34: 155-167. 1920.—A historical review of the development of the Landes as a timber and turpentine producing region.—*C. R. Tillotson.*

1864. LR. **Aus ein Zypressenhain in Amerika.** [A cypress grove in America.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 270. 2 illus. 1920.—A note on Monterey cypress (*Cupressus macrocarpa*), with a description of the peculiar gnarled growth.—*F. S. Baker.*

1865. M'PHERSON, ALEX. **Commercial forestry in the Highlands.** *Trans. Roy. Scottish Arboric. Soc.* 34: 178-181. 1920.—Present tax laws make it impracticable to grow mature timber in the Scottish Highlands although timber of a superior quality can be produced there. The growing of pitwood should be the staple form of forestry. Plantations 19 and 27 years old disposed of for this purpose have yielded returns above interest of 16s. 9d., and £3 4s. 5d. per acre respectively. Pitwood on a 19-year rotation is a more profitable investment for land owners than sheep farming.—*C. R. Tillotson.*

1866. MOTTI, KARL. **Die forstlichen Verhältnisse im oberen Friaul.** [Forestry situation in upper Friuli.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 250-251, 255-257. 1920.—A description of the Aupatal or Val d'Aupa in upper Friuli, from a general and forest standpoint. This valley is in the Dolomite Alps in a region noted for torrents. It has good natural forests, mostly of spruce, but they have been much mismanaged. The article includes a description of the principal timber bodies and general forest conditions. No statistical information is included.—*F. S. Baker.*

1867. PACK, A. N. **Pulpwood from British Columbia.** *Amer. Forestry* 26: 715-719. 8 fig. 1920.

1868. PESCHAUT, ROMAN. **Elektrizität und Forstwirtschaft.** [Electricity and forestry.] *Allg. Forst- u. Jagd-Zeitg.* [Wien] 38: 129-130. 1920.—Large power developments are planned on the Danube and other Austrian streams; there is considerable irregularity of flow, however, and dams will be necessary. The present over-cutting on higher watersheds and the unrestricted use of litter is tending to make the run-off still more irregular. The maintenance of forest cover is necessary for the most complete utilization of water for power, as is demanded by the proposed hydro-electric developments in Austria.—*F. S. Baker.*

1869. PETRASCHKE. **Die weitere Entwicklung der Kiefern-Hartznutzungstechnik.** [Further development of the turpentine technique in the pine.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 279-281, 285-287, 291-292. 1920.—This is a review and compilation of articles by many writers. It covers the anatomical and physiological factors governing resin production and flow, and the different methods that have been devised for tapping the trees and securing the resin, particularly the experimental methods using different forms of chipping and different frequencies.—*F. S. Baker.*

1870. PRINTZ, E. **Schwedens Holzhandel und Holzindustrie.** [The Swedish lumber industry.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 219-221. 1920.—This is a statistical article based on 2 books: "La Suede, son peuple et son industrie" by G. SUNDBERG, Stockholm, 1900, and "Eine forstliche Studienreise nach Schweden" by GABRIEL JANKA, Vienna, 1914.—*F. S. Baker.*

1871. RAGL, F. X. **Streunutzung in bayrischen Staatswald.** [Use of litter in Bavarian state forests.] *Allg. Forst- u. Jagd-Zeitg.* [Wien] 38: 89. 1920.—During the war, regulation of the use of litter was relaxed and the annual consumption rose from about 735,000 cubic m. to millions. Many forests are now completely cleared and the demand far exceeds the supply. Reproduction is falling off and production is decreasing. Growth is less a function of stocking than of ground conditions, as shown by 2 similar adjacent areas. In the first the litter is

used and in the second it is left. Volume growth on the 2 areas is as 1 is to 2.5, the quality coefficient as 1 is to 1.5. Litter is deficient in potash and phosphorus and makes a poor fertilizer for agriculture; its highest value is realized in the forest.—*F. S. Baker.*

1872. RECORD, S. J. Scented woods. *Amer. Forestry* 26: 665-672. 20 fig. 1920.—A popular description of various odoriferous woods.—*Chas. H. Otis.*

1873. REISNER, J. H. Progress of forestry in China. *Amer. Forestry* 26: 655-658. 5 fig. 1920.

1874. RETTMEYER. Zum Windmantel 5 des Forstgesetzes. [Windbelts, section 5 of the forest laws.] *Wiener Allg. Forst- u. Jagd-Zeitg.* 38: 249-250. 1920.—A discussion of the meaning of the law and its practical application under different conditions.—*F. S. Baker.*

1875. ROWE, M. H. Mixed woods. *Quart. Jour. Forest.* 14: 171-176. 1920.—A silvicultural discussion of the advantages and disadvantages of mixed woods with suggestions as to desirable and undesirable species in mixture. The point is made that the safest and at the same time most easily managed system of mixing is by groups which are planted pure. Groups of shade-bearing species should be at least $\frac{1}{2}$ acre in size, more if possible; groups of light demanders should never exceed $\frac{1}{2}$ acre in extent, preferably $\frac{1}{4}$ acre. There is a good reason for small groups of light-demanding trees. After the thicket stage is past, the characteristic opening out inevitably ensues, thus permitting soil deterioration.—*C. R. Tillotson.*

1876. SIECKE, E. O., AND L. WYMAN. Forestry questions and answers. *Texas Agric. Exp. Sta. Forest. Bull.* 12. 15p. 1920.—This bulletin consists of general questions and answers as to present areas and conditions of Texas forests and other forestry problems of an elementary nature. One map shows the forested areas and type of forest in each; another divides the state into 5 tree-planting districts and lists trees suitable for each.—*L. Pace.*

1877. SIM, T. R. Pine tree culture in South Africa. A summary of the results of practical experiences. *South African Jour. Indust.* 4: 65-75. 1921.

1878. SIM, T. R. Timber trees for commercial culture. Species that have been tried in South Africa. *South African Jour. Indust.* 3: 1030-1039. 1920.

1879. SIM, T. R. Timber trees for South Africa. Eucalypts and others considered in detail. *South African Jour. Indust.* 3: 1155-1172. 1920.

1880. SISSON, G. W., JR. The pulp and paper industry. *Amer. Forestry* 26: 687-688. 1920.—[Extracts from an address at the New England Forestry Conference, Aug., 1920.]

1881. SLAVIK, VICTOR. Die Nonne. [The nun moth (*Liparis monacha*).] *Allg. Forst- u. Jagd-Zeitg.* [Wien] 38: 96-99, 110-111. 1920.—A full discussion of methods in vogue for discovering and destroying the nun moth, including the collection of caterpillars on standing and felled trees, destruction of eggs and general management of affected stands. Thinnings between April and August should not be carried on in affected forests. Fifteen points are enumerated in conclusion bearing on control of the nun, ranging from direct destruction to indirect educational means.—*F. S. Baker.*

1882. SMYTHIES, E. A. Afforestation of ravine lands in the Etawah District, United Provinces. *Indian Forest Rec.* 7³: 1-32. Pl. 1-34. 1920.—Deforestation and over-grazing are responsible for severe ravine erosion in all stream beds in the Gangetic plain where the population is dense. To check the erosion, it is proposed to reduce the velocity of the water by means of small dams and to improve the soil cover at the head of ravines. In the filled-in basins behind the dams trees are planted which make an excellent growth. On steep slopes, small contour terraces are made to prevent soil wash, to collect and store water, and to furnish places for seed and tree planting. The work is to be carried on as a measure of famine relief; and as labor at that time is cheap and plentiful, the work can be done at small cost, while the government receives a benefit from the famine relief.—*E. N. Munns.*

1883. STEWART, HUGH SHAW. Observations on the planting of the quicker growing conifers. Trans. Roy. Scottish Arboric. Soc. 34: 141-145. 1920.—Spacing even as close as 3 feet in the case of Douglas fir and Japanese larch does not prevent, and only partially restrains, branch growth. If clean boles are required, hand pruning close to the stem must be resorted to. Such spacing, moreover, results in the production of many suppressed boles of little value which interfere with the root development of the more vigorous, dominant neighbors. Spacings of $5\frac{1}{2}$, 6, and 7 feet are advocated respectively for Sitka spruce, Japanese larch, and Douglas fir.—*C. R. Tillotson.*

1884. STUART, J. S. NIBLOCK. The effect of storms on certain forests in the Tsolo district, Cape Province. Jour. Dept. Agric. Union of South Africa 1: 750-754. 3 pl. 1920.

1885. TROMP, F. J. Essential oils, with special reference to those obtained from the Eucalypts. South African Jour. Indust. 4: 85-89. 1921.

1886. VENDELMANN, HENRY. Forestry by precultures. Quart. Jour. Forest. 14: 185-190. 1920.—Forestry by precultures has been attended with such striking success that it is being widely adopted. It consists in improving the soil to such an extent that it becomes suited to the varieties of trees which have been selected for planting. Improvement of the soil is brought about by deep surface plowing, subsoil plowing where there is hardpan, the adding of commercial fertilizers, and the growing of green manures. This is followed by an agricultural crop, against which the cost of soil improvement can be charged. Some trees can be grown by sowing the seed with the grain crop. In the case of others, 1 or 2-year seedlings are planted following the removal of the grain, the land being in such condition that planting can be carried on very rapidly. In December (shortest days of the year) an average of 8,000-9,000 1-year firs were planted in a day by 1 splitter and 2 boy planters. On a particular day, 1 splitter and 3 boy planters put in 18,000 plants.—*C. R. Tillotson.*

1887. WATT, A. S. The biological basis of forestry. Trans. Roy. Scottish Arboric. Soc. 34: 210-216. 1920.—The author emphasizes the need of an adequate understanding of the biological factors entering into the growth of trees in stands in order to place forestry upon a scientific as well as a sound economic basis and to avoid the evil results of the application of imperfect knowledge.—*C. R. Tillotson.*

1888. WEISS, F. E. Fibre yielding plants and their economic importance. Ann. Rept. and Trans. Manchester Microsc. Soc. 1919: 25-31. 1920.—Presidential address delivered February 13, 1919. A brief enumeration and description of plant tissues and parts used in various portions of the world in the making of paper, cordage, and textiles.—*C. E. Allen.*

GENETICS

G. H. SHULL, *Editor*

J. P. KELLY, *Assistant Editor*

(See also in this issue Entries 1589, 1590, 1601, 1608, 1615, 1774, 1812, 1837, 1857, 1955, 1962, 1967, 1972, 1974, 1975, 1990, 2012, 2091, 2104, 2194, 2263)

1889. ANONYMOUS. [Rev. of: ADAMI, J. G. Medical contributions to the study of evolution. xviii + 372 p., 7 pl., 18 fig. Duckworth & Co.: London, 1918.] Sci. Prog. [London] 13: 679-681. 1919.

1890. ANONYMOUS. Biology of endogamy and exogamy. [Rev. of: EAST, E. M., AND D. F. JONES. Inbreeding and outbreeding: their genetic and sociological significance. 285 p. J. B. Lippincott Co.: Philadelphia and London, 1919.] Nature 106: 335-336. 1920.—See Bot. Absts. 4, Entry 571.

1891. ANONYMOUS. South African's views of citrus methods used in California. [Rev. of and extracts from: FITZPATRICK, PERCY. *Citrus growing in California*. 32 p. National Bank of South Africa, Pretoria, 1920 (see Bot. Absts. 8, Entry 1910).] *California Citrograph* 6: 46, 62-64, 78, 99. 2 fig. Dec., 1920, and Jan., 1921.

1892. ANONYMOUS. [Rev. of: GAGER, C. S. *Heredity and evolution in plants*. xv + 265 p., 113 illus. P. Blakiston's Son & Co.: Philadelphia, 1920 (see Bot. Absts. 6, Entry 1672; 7, Entry 1610).] *Sci. Prog.* [London] 15: 498. 1921.—See also Bot. Absts. 8, Entry 1079.

1893. ALDER, B. How to cull a flock of hens. *Utah Agric. Exp. Sta. Circ.* 42. 3-8, 5 fig. 1920.—Author gives directions for distinguishing between laying and non-laying hens on the basis of the bodily changes which accompany the transition from one condition to the other.—*William A. Lippincott*.

1894. ANTHONY, R. Le pseudo-hermaphroditisme tubaire chez les Cétacés mâles. [Pseudo-hermaphroditism in the male Cetaceans.] *Compt. Rend. Acad. Sci. Paris* 171: 1398-1399. 1920.—Well developed male utricles and Muellerian ducts are regularly or occasionally found in male Cetaceans. Author regards this condition as primitive.—*A. Franklin Shull*.

1895. BECKER, J. Xenien zwischen Melonen und Gurken. [Xenia in muskmelons and cucumbers.] *Zeitschr. Pflanzenzücht.* 7: 362-364. Nov., 1920.—A testing out of the belief that cross-pollination of melons and cucumbers leads to xenia as evidenced by undesirable flavors. One cucumber resulted from 10 guarded hybridizations with melon pollen; its seeds were undeveloped but its flavor was not unusual.—*J. P. Kelly*.

1896. BENJAMIN, E. W. A study of selections for the size, shape, and color of hens' eggs. *Cornell Univ. Agric. Exp. Sta. Mem.* 31. 189-312, 1 pl., 37 fig. 1920.—This report covers the work of 8 years in which the author kept under minute observation and careful control large flocks of single-comb white Leghorn hens from the high-producing, trap-nested stock of the Cornell strain. Many correlation tables are presented.—The results show that a great deal of variation exists in the size, shape, and color of eggs from a single hen. This variation does not depend upon difference between the parents, but it is to some extent inherited. Color tends to be more irregular than the other characters. Size, shape, and color are inherited directly and equally from both parents. Small size and length of egg are dominant while no dominance occurs for color. A definite correlation exists between the characters of the egg set and those of the eggs of the hen it produces. This correlation, however, is not as great as the correlation between the means of the eggs produced by parents and offspring. No correlation was found between size, shape, and color, or any two of these characters. The size of eggs increases rapidly during the early part of the pullet year, while pigment continues to become darker until the end of the 2nd laying year. The offspring from pullets' eggs are not more variable than those from hens' eggs.—A positive correlation was found between the size of the egg and the weight and vigor of the bird produced. Size, shape, and color have no effect on the ability of the egg to hatch.—*H. G. May*.

1897. BLARINGHEM, L. Anomalies florales observées sur la descendance de l'hybride *Linaria vulgaris* × *L. striata*. [Floral anomalies observed in the descendants of the hybrid *Linaria vulgaris* × *L. striata*.] *Compt. Rend. Acad. Sci. Paris* 169: 1103-1105. 1919.—The F₁ of the cross of *Linaria vulgaris* × *L. striata* was found to be partially sterile, and only 17F₂ plants were obtained. There was some sterility in the F₂ and several cases of abnormal floral development were observed.—*Karl Sax*.

1898. BRIDGES, CALVIN B. The mutant crossveinless in *Drosophila melanogaster*. *Proc. Nation. Acad. Sci.* 6: 660-663. 1920.—Author describes "crossveinless," a sex-linked mutant character in *Drosophila melanogaster*, and points out its usefulness in genetical experiments and its apparent homology with "crossveinless" in *D. virilis*.—*C. W. Metz*.

1899. BRYAN, W. E., AND C. O. BOND. **Plant breeding.** Arizona Agric. Exp. Sta. Rept. 29: 314-321. 1918.—Breeding results obtained in an effort to produce wheat of high yield with high gluten content of superior quality. For irrigated valleys of Arizona earliness is of prime importance in establishing such a wheat. Where late spring irrigation is necessary for late varieties quantity and quality of gluten are reduced.—Brief reports of investigations with beans, alfalfas, and sorghums are also made.—*J. P. Shelton.*

1900. BURGESS, C. H. **Breeding for egg production.** Michigan Agric. Exp. Sta. Quart. Bull. 2: 190-192. 1 fig. 1920.—Data are presented which indicate "that higher egg-producing power" may be introduced into a flock of barred Plymouth Rocks or single-comb white Leghorns through males from high-producing dams.—*William A. Lippincott.*

1901. BUSH-BROWN, H. K. **Heredity in horses.** Jour. Heredity 11: 215-227. Fig. 16-27. 1920.—Distinction is made between skeleton of the Arab horse, which has 5 lumbar vertebrae, and all other horses, which have six. This difference is given as one of the outstanding causes of the greater endurance of the former. The limited data available indicate the short back to be recessive to the long back. A jenney bred to a stallion produced a hinney which inherited the 5 lumbar vertebrae of the dam. Likewise, a short-back mare bred to a stallion with 24 vertebrae produced a short-back offspring. The 3 instances of this combination led the author to suggest the dominance of the dam over the anatomy of the foal. The strength of the Arab horse as a weight-carrier is attributed to the shorter distance between the supports. In the army tests of 1920 the endurance of the Arab horses and their derivatives was superior to that of others.—*M. J. Dorsey.*

1902. CHERRY, T. **The evolution of man and his mind.** Sci. Prog. [London] 15: 74-100. 1920.—A speculation in regard to the origin of man. "The recent advances in knowledge have introduced new difficulties both on the side of structure and of function, and have made untenable the current theory of the comparatively recent separation of the human and the ape stocks." These difficulties are discussed under 2 examples of structure—(a) the premaxilla, present in the apes and absent in man, and (b) the foot; and 2 examples of function—(a) instinct, practically lacking in man, and (b) the growth and metabolism of the body, based on RUBNER'S work. Other difficulties are mentioned and the importance of DOLLO'S law of the "irreversibility of the course of evolution" is emphasized.—The writer then undertakes to reconstruct a theory of human phylogeny. He starts with "a generalized primate of the *Anaptomorphus* type . . . about as large as a rat," inhabiting trees of the Lower Eocene and feeding on birds chiefly by night. Probably during the Eocene "the lemurs, New World monkeys, and Old World monkeys separated from one another" and in the Upper Eocene "the branch of the Old World monkeys which gave rise to the apes and man came to the ground." The common ancestor acquired a fair approximation to a bipedal gait and the diet consisted largely of lizards, grubs, and scorpions as evidenced by the digestive organs. The changes that now take place leading toward man require 2 conditions of environment, namely, abundance of easily obtained nitrogenous food, and safety. These conditions are most fully met on the seashore. "It is therefore in no way improbable that one family of the Late Eocene primates may have chanced on some part of the beach where shellfish are plentiful and there begun a course of evolution different from all their former associates in the trees." Ancestors of the apes from time to time, but at a very early period, left the seaside and returned to the trees; first, the early gibbons, next the orang, and finally the common ancestor of the gorilla and chimpanzee, leaving the human stock to work out its evolution under seaside conditions. The writer then develops his theory of the evolution of man in adaptation to a seashore environment, including small teeth, slow movements, lack of organs for attack or defence, naked skin, monthly cycle in woman, free shoulder-joint, and development of the brain.—*Howard J. Banker.*

1903. COLLINS, G. N. **Dominance and the vigor of first generation hybrids.** Amer. Nat. 55: 116-133. 1 fig. Mar.-Apr., 1921.—Author believes that the explanation of heterosis should place emphasis on suppression of deleterious recessive characters rather than on accumulation of

dominant growth factors. Evolutionary progress depends on advantageous variations, but these are rare and their effect negligible in explaining heterosis. Practically all known maize variations are detrimental, and the vast majority of them recessive. (Deleterious dominant mutations are quickly eliminated.) Furthermore, present knowledge indicates that the rôle of linkage must be of minor importance in maize; and the question is raised whether the assumption of linkage is necessary to explain heterosis.—Difficulty of securing uniform strains with the vigor of F_1 has been assumed rather than demonstrated, since selection following hybridization has never been continued long enough to approximate such homozygosity. Author considers certain data of EMERSON and EAST (1913) together with some of his own on height. "In every case where a progeny was grown from a plant near the upper limit of the range of the F_2 its mean exceeded that of the F_1 ." Some of the data on length and diameter of ear and length of internode also suggest isolation of strains with vigor of F_1 . Tables are presented showing extreme practical difficulty (due to large numbers which must be grown) of obtaining homozygous F_2 individuals with vigor of F_1 (even without assuming linkage). To obtain 1 individual 70 per cent homozygous, assuming 15 effective character pairs, would require growing 6000 F_2 individuals. On question of skew distribution of F_2 vigor due to dominance (without linkage), author presents significant table with accompanying graph. With 20 character pairs involved, populations of 500 individuals would conform with normal frequency curve; skewness would be detectable only in enormous F_2 populations. Assumption that relative effect of a given growth factor depends on size of organism also assists in veiling skewness. Author concludes that heterosis is due to suppression of deleterious recessive characters, and can be explained without assuming linkage.—*Merle C. Coulter*.

1904. CUTLER, D. WARD. The cytological problems arising from the study of artificial parthenogenesis. *Sci. Prog.* [London] 15: 435-444. 1 fig. 1921.—Review of some of the evidence for (1) individuality of chromosomes, and (2) relation of chromosomes to sex, preparatory to discussion of artificial parthenogenesis in later article.—*A. Franklin Shull*.

1905. DETJEN, L. R. Peloria in *Viola primulaefolia* Linn. *Torrey* 20: 107-116. 10 fig. 1920.—A strain of violets bearing peloric and partially peloric flowers was propagated from a single plant found in nature. The completely peloric flowers are symmetrical, having 4 sepals, 4 petals, 4 stamens, and a pistil of 4 carpels.—*E. G. Anderson*.

1906. DETLEFSEN, J. A., AND W. J. CARMICHAEL. Inheritance of syndactylism, black, and dilution in swine. *Jour. Agric. Res.* 20: 595-604. 1 pl. 1921.—A registered mule-foot boar (syndactyl, black) crossed with registered Duroc-Jersey sows (cloven-foot, red) produced only black, mule-foot pigs. The results of a back-cross with a Duroc-Jersey boar indicated independent segregation of a unit factor for mule-foot dominant over cloven-foot and a unit factor for black dominant over red. The red cloven-foot segregates bred true in F_3 and F_4 . The "red" segregates varied between intense red and cream. The so-called creams were absolutely white at birth, merely developing traces of yellow medullary pigment later. The data were insufficient to determine the mode of inheritance of the grades of intensity but confirmed earlier work indicating that white in swine often represents extreme dilution of red due to factors which dilute red but which do not dilute black to a perceptible extent.—*Sewall Wright*.

1907. DETLEFSEN, J. A., AND E. ROBERTS. Studies on crossing over. I. The effect of selection on cross-over values. *Jour. Exp. Zool.* 32: 333-354. 2 fig. Feb. 20, 1921.—The authors selected for high and low crossover values in *Drosophila melanogaster*. They used the characters white and miniature, the genes of which lie in the X chromosome. In order to save work and time single pair matings were made only in alternate generations. The other generations were mass cultures. In the A series the first 5 generations of selection made no change. There was considerable fluctuation. After the 5th generation progress was rapid. The normal percentage of crossing over between white and miniature is 33. In F_2 the authors had reduced it to 16.49. From F_{10} to F_{13} the percentage was reduced to less than 1. The last generations were bred under abnormal conditions and the numbers were few. Series A_1

was started from the 7th generation of series A and continued to F_{15} . The average percentage for these generations was 0.64. Here again the numbers were not large. Series B was also selected for low crossover values. For the first few generations there was no effect. In F_7 a pair gave 14.34 per cent. From F_8 to F_{14} the percentage fluctuated between 10 and 23. From F_{15} to F_{23} it varied around 10 and from F_{23} to F_{29} around 6. After F_{23} the line bred true for low crossover values in mass cultures for 23 generations.—Series C was selected for high crossover values. It was carried for 8 generations only and no progress was made. In F_7 9 pairs gave low crossover values, less than 6 per cent. The authors interpret this to mean that double crossing over had been induced, resulting in a decreased percentage. After making several suggestions the authors concluded that "crossing over in the various regions of the sex chromosome is probably controlled by multiple incompletely dominant factors."—*F. Payne.*

1903. EAST, E. M., AND D. F. JONES. Genetic studies on the protein content in maize. *Genetics* 5: 543-610. 8 fig. Nov., 1920.—Following a discussion of breeding plants for altered chemical composition, the work of the Illinois Agricultural Experiment Station on high and low protein content in maize is reviewed in detail. The conclusion is reached that the individual seed rather than the entire ear should be used as the basis of selection. In a comparison between guarded self-pollinated ears and open or wind-pollinated ears, it was found in the majority of cases that the seeds of the self-pollinated ear had the highest percentage of protein. Pursuing the problem from this point, a test was made to determine the immediate effect of pollination on the composition of the seed. It was found that in each of 32 comparisons the crossed seeds weighed more than the selfed seeds, supporting previous results. With respect to the protein content the effect of cross-pollination is slight, 7 of the 32 cases showing an increased percentage of protein but on the average a slight decrease. This decrease is not accounted for entirely by the increase in weight of seed since the total amount of protein also is increased.—When a mixture of pollen from high- and low-protein plants was applied to plants of a high-protein strain a significantly higher percentage of protein was found where both parents were high in protein. The protein content of different self-pollinated ears borne on the same plant was tested and little difference found.—In a chemical analysis of 2nd generation seeds borne on 1st generation plants it was found that while the percentage of protein was reduced the total amount per acre was increased due to the increase in yield.—In conclusion the authors state that the protein content of the seeds is determined largely by heredity although variations as high as 40 per cent may be caused by environmental fluctuations. The number of differentiating hereditary factors involved cannot be determined nor their method of inheritance described, but they are believed to be in excess of 5 or 6 with the possibility of a smaller number of main factors and numerous subsidiary ones.—Twenty per cent of the protein of the seed is in the embryo and 80 per cent in the endosperm. The notable variations appear in the endosperm. Heterosis increases the size of the seeds with a consequent reduction in the per cent of protein. This is especially noticeable in seeds borne by hybrid plants. F_1 seeds when corrected for the influence of heterosis have a protein content intermediate between those of the parents, with perhaps a tendency to be closer to that of the high-protein parent.—The factors borne by the male gamete are practically without immediate influence on the protein content leading to the belief that the constitution of the mother plant is the major determining factor.—If a high-protein strain is found to be desirable it can be obtained more rapidly by the isolation and recombination of homozygous high-protein strains than by the method of mass selection followed in the classical experiment at Illinois.—*J. H. Kempton.*

1909. FIRBAS, HEINRICH. Über die Erzeugung von Weizen-Roggenbastardierungen. [The production of wheat-rye hybrids.] *Zeitschr. Pflanzenzücht.* 7: 249-282. Nov., 1920.—Author studied conditions affecting set of seed when wheat was crossed with rye. Flowers were pollinated just after blooming and also at later dates, better results being obtained with the earlier applications. Pollinations were made in heated and unheated rooms, under dry and moist conditions, and at different times of the day; it is concluded that such external condi-

tions had little or no influence on the setting of seed. Old pollen gave apparently as good results as fresh, other conditions being equal.—Whether glass tubes or paper were used in covering the flowers did not affect the results. The factor that played the greatest part in securing a good set of seed was the difference between wheat races and between individuals within these races. The influence of the individuals in obtaining many seeds is not the same for all races. With some races the individuality is of greatest importance. The influence of the individual is greater with wild races than with cultivated ones. Individuality in the case of the male plants is not marked.—Reciprocal crosses using rye as the female parent have not yet been obtained.—Certain wheat races, such as Bokara, give more seed when pollinated with rye.—*H. H. Love.*

1910. FITZPATRICK, PERCY. *Citrus growing in California*. 32 p. National Bank of South Africa, Pretoria, [1920].—A popular discussion is included of "bud variation" in citrus fruits, with especial consideration of SHAMEL's work and of the resulting practice of propagating from "performance-record" trees. WEBBER's study of variation in seedling stocks is also discussed.—*Howard B. Frost.*

1911. FRANCE, L. V. The problem of controlled fertilization of queen bees. *Jour. Econ. Entomol.* 14: 105-110. Feb., 1921.—Author emphasizes the importance to commercial beekeepers of controlled matings and cites a number of experiments recorded in the beekeeping literature to this end. No new trials are recorded.—*E. F. Phillips.*

1912. GALANT, S. Über die Entstehung von Variationen bei *Anemone hepatica*. [On the origin of variations in *Anemone hepatica*.] *Biol. Centralbl.* 39: 529-535. 1919.—Observations were made on 1729 flowers of *A. hepatica* [*Hepatica triloba*] gathered on the Belpberg. Modal number for colored perianth leaves (referred to as petals) was 6 and was shown in 1180 of the 1729 flowers; range was from 7 to 11, inclusive. Mode for sepal-like leaves was 3 exhibited by 1665 flowers, and range was from 2 to 5, inclusive. No calculated constants are given. Author dissents from BOHN's hypothesis that variations in general indicate disease and suggests that increase in number of petals is due to metamorphosis of stamens or sepals. He comments also on color variation, noting especially that 2 white flowers occurred in a total of 1729, and quotes CHODAT to the effect that whiteness maintains itself in cultures.—*James P. Kelly.*

1913. GILLIES, C. D. Variation of sepals of *Bruguiera Rheedii* Blume. *Proc. Roy. Soc. Queensland* 30: 95-96. 1918.—The calyx of the mangrove is a conspicuous red structure commonly found in the tidal debris along the ocean shores at certain points. In 118 calyces collected the number of sepals varied from 9 to 13, the frequencies being as follows:

No. of sepals.....	9	10	11	12	13
Frequency.....	13	47	38	17	3

From these data the following constants were calculated: Mean, $10.57 \pm .002$; mode, 10.471; standard deviation $3 \pm .001$; coefficient of variability, $2.84 \pm .001$. The frequency polygon is unimodal; the theoretical mode is 10.471; actual mode, 10. Coefficient of variability, 2.84, is a low value.—*E. B. Babcock.*

1914. GOODALE, H. D., RUBY SANBRON, AND DONALD WHITE. Broodiness in domestic fowl. Data concerning its inheritance in the Rhode Island Red breed. *Massachusetts Agric. Exp. Sta. Bull.* 199. 93-116, 4 fig. 1920.—A broody bird in the Rhode Island Red breed is recognized by its tendency to remain on nest when not laying, the ruffling of feathers and clucking. Confinement for 3-6 days with food breaks up broodiness. Hens are grouped as broody and non-broody. Broody hens may have a broody period early in 1st laying year or later. Broody periods usually recur at short intervals after the 1st period. Non-broody hens sometimes show broodiness in succeeding years.—The data confirm the theory that broodiness is due to 2 dominants; but some evidence also exists that a dominant for non-broodiness is present in some cases. Selection quickly changed a very broody flock to one with few broody hens. Matings between non-broody stock sometimes give broody offspring.—*H. G. May.*

1915. GUILLEMINOT, H. Le deuxième postulat du calcul des probabilités et la loi d'option dans l'évolution de la matière vivante. [The second postulate of the calculus of probabilities and the law of option in the evolution of living matter.] *Compt. Rend. Acad. Sci. Paris* 169: 993-995. 1919.—Organic phenomena differ from inorganic in that the probability of a given reaction of an organism is affected by its prior reactions.—*John Rice Miner*.

1916. HAECKER, V. Über weitere Zusammenhänge auf dem Gebiete der Mendelforschung. [On further correlations in the field of Mendelian investigation.] *Pflügers Arch. Ges. Physiol.* 181: 149-169. 1920.—A theoretical discussion of relations between mode of development of characters and mode of inheritance. Author holds that characters which are caused in a simple way and undergo autonomic development from the first appearance of the "anlage" are apt to show clear-cut segregation, while characters which are caused by a complex of causes and with correlative development tend to show more or less departure from the Mendelian scheme, as irregular dominance, unusual ratios caused by impure segregation, modifiability by selection, and, if pathological, correlation or alternation with other anomalies. A given character of the 1st class is likely to appear in many more or less closely related species, while characters of the 2nd class tend to be limited to one species. Those of the 1st class arise by mutation, those of the 2nd by gradual change; those of the 1st class are degenerative or of no biologic significance, while the 2nd class includes the adaptive and other species-forming changes.—*Sewall Wright*.

1917. HARLAND, S. C. Inheritance of certain characters in the cowpea (*Vigna sinensis*). II. *Jour. Genetics* 10: 193-205. 1920.—Experimental genetic data on 4 series of characters in cowpea—anthocyanin in stem and leaf stalk, seed-coat pattern color, pod color, and flower color. Results on F_1 , F_2 , and F_3 generations are given. Anthocyanin coloration in stem and leaf stalk is due to factor X , dominant to its absence. Seed-coat pattern colors—black, brown, buff, maroon, red, and white—result from various combinations of 4 factors, B (black), N (buff), M (maroon), and R (red), and their absences. New-Era pattern of seed coat is due to factor E , which expresses itself only in the presence of R . The albino type, Para. carries 2 seed-coat pattern factors, D and H (either H_1 or H_2), which produce no visible expression except in the presence of R . Purple-pod types differ from green-pod types by 1 main factor, P , although F_2 ratio suggests that more than 1 pair of factors may be involved. Purple pod is partially dominant in F_1 . Pigment factors B (black) and E (New Era) show repulsion on a basis probably higher than 1:15. Factor B also shows repulsion with factor P (purple pod), probably on a basis higher than 1:7. Tinged flower color is due to factor G , dominant to its absence but recessive to D , the factor for dark flower color.—*Orland E. White*.

1918. HARLAND, S. C. Inheritance in *Ricinus communis* L. Part 1. *Jour. Genetics* 10: 207-218. 1920.—Experimental results involved data on 3 sets of characters, as follows: Presence and absence of a waxy bloom on stems, petioles and capsules; presence and absence of spines on capsules; and stem colors of 4 kinds. Previous investigations are reviewed. F_1 , F_2 , and F_3 results are tabulated. Presence of bloom (B) is partially dominant to its absence (b). Spiny capsule (S) is partially dominant to its absence, smooth capsule (s). Two pairs of factors are concerned in crosses involving stem color, as green \times mahogany gave in F_1 , rose, which in F_2 gave approximately 9 rose: 3 mahogany: 3 green: 1 tinged. The results are interpreted as due to combinations of 2 pairs of factors—the presence and absence of M (mahogany) and the presence and absence of G (green). The F_2 ratio would be 9 MG : 3 Mg : 3 mG : 1 mg . Experiments so far show that S and M , S and B , M and G , and perhaps G and B are not linked. Factors M and B show repulsion in cross $Mb \times mB$.—*Orland E. White*.

1919. HARTLEY, C. P., AND H. S. GARRISON. Reproducing power of well-filled vs. poorly filled ears of maize. *Amer. Nat.* 55: 184-187. 1 fig. 1921.—Occasionally poorly fertilized ears of maize are found in which the failure to develop seed normally is due to accidental causes. An effort was made to determine whether the yielding power of such ears was as great as that of ears normally fertilized. Poorly fertilized ears were produced artificially by 2 methods,

(1) bagging silks an inch long after they had been exposed to pollen, and (2) exposing previously bagged silks for about half an hour and then rebagging. In neither case was the source of the pollen controlled. The ears of the 1st lot had seeds arranged compactly but confined to the butts, while those of the 2nd lot had seeds scattered throughout. Both lots were compared with normally fertilized ears of the same strains but no significant differences in yield were obtained.—*J. H. Kempton.*

1920. HONING, J. A. *Selectie-Proeven met Deli-Tabak IV.* [Selection experiments with Deli tobacco IV.] Mededeel. Deli-Proefsta. Medan [Sumatra] II. 10: 43-59. 1920.—In the 1918 large-scale tests, light (colored) line No. 1 produced longer, broader leaves lighter in color, with less of the fallow-colored and checkered or dapple grades, as compared with the control tobacco, the results thus agreeing with those obtained in 1917 and 1918. This line is especially valuable on the higher-lying estates which tend to produce relatively dark tobacco. Fallow-colored line 3 yielded a distinct fallow shade, running through all the color grades. The percentage of checkered leaf was smaller than in the control but the leaf was somewhat shorter and a little dryer in character. Two additional lines gave good results while another was not a success. A new selection grown on 16 estates did not equal some of the older strains.—*W. W. Garner.*

1921. HUMPHREY, S. H. *The menace of the half-man.* Jour. Heredity 11: 228-232. 1920.—A general discussion of the rate of reproduction in the "morons" or "borderliners," so-called poorer stocks, and best stock, in its bearing upon the national life and society. The influence of the reproduction rate of the poorer stocks is traced in the school, in charity, and in industry. Emphasis is placed upon the futility of attacking the problem through an improved environment when heredity is at its base.—*M. J. Dorsey.*

1922. JOHNSON, E. C. *Twenty-ninth annual report.* Washington [State] Agric. Exp. Sta. Bull. 155. 57 p. 1920.—Brief summary is made of inheritance, in wheat crosses, of resistance to smut. In crosses between winter and spring wheats the F_1 ripened late. In F_2 , spring, F_1 , and winter type appeared in a 1:2:1 ratio. Minor factors were also involved.—Early dropping of apple fruit was found to be correlated with failure to set sufficient seeds per fruit. As much as 68 per cent of dropped fruit contained no normal seed.—Plans for Mendelian studies with blackberry and raspberry hybrids are outlined. [See also Bot. Absts. 7, Entry 1554.].—*H. K. Hayes.*

1923. KEMPTON, J. H. *A brachytic variation in maize.* U. S. Dept. Agric. Bull. 925. 28 p., 19 pl., 8 fig. 1921.—A new dwarf type of maize, "brachytic," is described and its inheritance discussed. This type is the result of a shortening of the internodes without corresponding reduction in their number or in the number and size of other organs. It was discovered in a 2nd hybrid generation of a cross between Algerian pop-corn and Chinese waxy-endosperm corn, the inference being that it had been carried by the Chinese parent as a recessive, heritable character.—When self-pollinated, the brachytic type produced nothing but brachytic plants. When crossed with normal-type plants, the F_1 proved to be tall and in F_2 the brachytic character segregated in the simple monohybrid fashion. The F_2 brachytic segregates, from a Boone County White-brachytic cross, showed no increase in variability as regards height of plants compared with ordinary brachytic plants. The length of ear, however, of some of these dwarf segregates appeared to be increased, showing that the dwarf type can be maintained and the yield increased somewhat by such crossing. This is an important consideration if the brachytic type is ever to be used commercially (a possibility that the author suggests) since its present yield is relatively low. For dry land and irrigated regions, the brachytic type of structure might prove to be well adapted.—Two teratological forms of maize are also described and a preliminary note concerning their heritability is given. In one of these, designated "adherent," the leaves of the seedling, or even of mature plant, do not unroll normally. The growing culm is unable to break through these leaves and is forced into many contortions in attempting to elongate. This form appears to be recessive in inheritance.—Another abnormality described is one in which the ears end in staminate

spikes. The inheritance of this type is not completely solved as yet. From the appearance and development of ears ending in staminate spikes and of ears borne as basal branches of the terminal inflorescence (noted in a Hopi-brachytic cross), the author suggests "that the ear of maize may have developed from the basal branches of the terminal panicle rather than from the central spike of the terminal inflorescence of a lateral branch of the main culm."—Many good illustrations are given of the types of maize under discussion.—*E. W. Lindstrom.*

1924. KEMPTON, J. H. Linkage between brachytic culms and pericarp and cob color in maize. Jour. Washington [D.C.] Acad. Sci. 11: 13-20. 1920.—Author summarizes genetic linkages that have been reported for maize and describes a new case of linkage. Brachytic (*br*) maize, which is a dwarf type recessive to normal stature, is found to be linked with pericarp and cob color. Three crosses involving the normal-brachytic and colored-colorless pericarp and cob factors give fairly large F_2 distributions showing linkage relations that varied from 35 to 38 per cent crossing over.—Data are presented from these F_2 families that indicate independent inheritance between brachytic culm and liguleless leaf as well as between cob color and liguleless leaf.—*E. W. Lindstrom.*

1925. KOTTUR, G. L. "Kumpta" cotton and its improvement. Mem. Dept. Agric. India Bot. Ser. 10: 221-272. Pl. 1-7. 1920.—"Kumpta" is the trade name of a type of *Gossypium herbaceum* extensively grown in India. Author demonstrated that the type comprises several strains differing in number of vegetative branches, size and shape of leaves, length of bracts and petals, size and shape of bolls, weight of seed, and length of fiber. A strain developed by selection and decidedly superior to the average of the type in habit of growth, earliness, productivity, and abundance and length of fiber is described.—*T. H. Kearney.*

1926. LAUGHLIN, HARRY H. Calculating ancestral influence in man; a mathematical measure of the facts of bisexual heredity. Genetics 5: 435-458. 2 pl., 1 fig. Sept., 1920.—Twenty-five formulae governing ancestral inheritance in general are presented, based on: (1) Bisexual reproduction; (2) heterozygosis for sex factor in one sex; and (3) the number of pairs of chromosomes. Cognizance is taken of the necessity for increased accuracy by means of future inclusion of provisions for sex-linked traits, relative weighting of chromosome groups, maternal or paternal source of chromosome, dominance or recessiveness of gene, and relative frequency of mutation, crossing-over, non-disjunction, and other special chromosome phenomena; but these are not considered in the formulae developed, since they would operate only as special modifications of the general case. Figure 1 presents a clever mechanism for demonstrating the segregation and recombination of chromosomes from ancestors to descendants, with specifications for its construction. Plate 1 diagrams ancestral inheritance in the human male, based on 12 pairs of chromosomes, showing the "X-trails" and "Y trails" of descent for the X and Y chromosomes, and calculates the average, range and chance of contribution of chromosomes to the F_1 zygote in P_2 , P_3 , and P , while plate 2 presents the same data for the human female, with suitable changes for sex. Similar constants for P_4 and P_5 are included in notes accompanying the plates.—*Edward N. Wentworth.*

1927. LINEBACK, P. E. A case of unilateral polydactyly in a 22-mm. embryo. Anat. Rec. 20: 313-319. 1 fig. Feb. 20, 1921.—A 22 mm. human embryo was found to have an extra digit on the radial side of the right hand. This is apparently the youngest polydactyl individual thus far recorded. Unfortunately there is no information as to its parentage. Microscopic study reveals all the usual cartilaginous elements of the hand present and normal. In addition there is a single extra cartilage associated with the supernumerary digit. There are two muscles extending into the extra digit, but no obvious nerves and only capillary blood vessels. The specimen "offers proof that some cases of polydactyly owe their origin to earlier causes than external factors or deviation of ossification centers." The condition is believed to be wholly distinct from hyperphalangy of the thumb.—*C. H. Danforth.*

1928. LITTLE, C. C. Report of the Committee on Genetic Form and Nomenclature. Amer. Nat. 55: 175-178. 1921.—This is the first report of a committee appointed in 1919 by the

American Society of Naturalists, and is a constructive attempt to promote an established system in genetic usage, particularly of symbols for the representation of factors. The report makes the following suggestions: (1) That a type (the wild when possible) be named, and that genetic factors in general be measured by their departure from this. (2) That members of an allelomorph series dominant to the type be designated by the same symbol as the type in capitals and with appropriate superscripts, and that recessive members have the same symbol in lower case with superscripts. (3) That dominance be recognized by departure from type in the heterozygote. (4) That in addition to literal (mnemonic) superscripts, numerical superscripts may also be used to indicate the relative degree of departure from type of each member of the allelomorph series. (5) Independent allelomorphs or allelomorph series may be represented by different letters, or, where they produce similar effects, by the same letter followed by a designating numeral. (6) "Doubtful factors," whose presence is uncertain, may be represented by their respective symbols with superscript x or $?$. (7) The presence of modifiers of the effect of any factor may be represented by the symbol $[+]$; thus $[S+]$ may represent "+ modifiers of the effect produced by the S (spotting) series of allelomorphs," and when it is desired to express the degree of modification, numbers may be used for that purpose, as $[+4.2]$ or $[-2.5]$. (8) "Linkage is best represented by the fractional form used by workers on *Drosophila*."—The report is published in the hope that it will stimulate discussion and suggestions.—*L. J. Cole.*

1929. McCANDLISH, A. C. **Environment and breeding as factors influencing milk production.** Jour. Heredity 11: 204-214. Fig. 6-15. 1920.—An account of an experiment at the Iowa Agricultural Experiment Station to demonstrate the possibilities of improving a scrub herd. The animals used were inferior as a dairy type and were low producers. These cows were put in with the Station herd and given the same feed and care as the pure breeds. Careful milk and butter-fat records were kept as guides to feeding methods. The scrub cows were mated to pure-bred sires of Holstein, Guernsey and Jersey breeds and the heifer calves resulting were maintained under the same conditions as the other animals. Records are now available on 2 generations of grades descended from scrub cows and 1 animal of the next generation has just entered the herd. The influence of environment upon production is shown by the records. When the scrub cows that came to the station after reaching maturity are compared with those coming at 4 years of age and with those coming before the first freshening, it was found that the former produced 14 per cent more milk and 8 per cent more fat, and the latter 27 per cent more milk and 24 per cent more fat. Scrub bulls will give no improvement in the production of a herd. Pure bred sires on the other hand showed a marked improvement in production in both the 1st generation and 2nd generation grades. The 1st generation taken as a group showed increases of 39 and 37 per cent in milk and fat production respectively when compared with their dams, and the 2nd generation, so compared, increases of 116 and 106 per cent respectively in milk and fat production. Both breeding and environment are thus shown to be important factors in production.—*M. J. Dorsey.*

1930. McROSTIE, G. P. **Inheritance of disease resistance in the common bean.** Jour. Amer. Soc. Agron. 13: 15-32. 1921.—Crosses between varieties of beans resistant to α and β strains of *Colletotrichum lindemuthianum* and 1 susceptible to α strain only, indicate that resistance to α strain is due to a single factor and is dominant. Crosses between a variety resistant to both strains and 2 varieties susceptible to both strains showed a 2-factor basis for resistance to both strains of the anthracnose fungus. In F_2 a 9:7 ratio was obtained. Significant variations in individual F_2 families are said to be due to difficulty in obtaining uniform conditions for infection in large outside inoculation chamber. Crosses between Robust Pea bean, highly resistant to mosaic disease, and of Flat Marrow bean, which is very susceptible, indicate 2 factors in homozygous state necessary for complete susceptibility. Absence of both factors gives high degree of resistance. One plant in 16 of F_2 generation of 5272 plants was severely infected. All gradations between resistance and susceptibility occurred. Susceptibility showed only partial dominance. Crosses between Flat Marrow, resistant, and Robust Pea, susceptible to root rot (*Fusarium martii phascoli*), indicated in

F₁ that susceptibility is partially dominant. A condition midway between that of plants showing greatest infection in any particular season and normal condition of healthy plants was chosen to separate classes. F₂ data were checked by growing F₂ families. A 2-factor basis in relation to root rot is indicated. Strains of commercial value resistant to both mosaic and root rot have been selected. On account of their parentage all of these should be resistant to β strain of *C. lindemuthianum*.—J. P. Shelton.

1931. MATHEWS, J. WRENFORD. Sheep and wool for farmers. Cross-breeding experiments. Results of lamb-raising trials. Agric. Gaz. New South Wales 31: 761-770, 846-852. 10 fig. 1920.—In previous experiments, rams of various long-wool breeds had been crossed with Merino ewes to determine which combination resulted in the greatest aggregate value of wool and mutton. None of the combinations produced lambs suitable for the export lamb trade. The present papers discuss in detail the results of crosses between rams of 3 short-wool breeds with ewes from 3 long-wool-Merino crosses. Good lambs were produced by all, but Dorset Horn rams sired consistently heavier lambs than Shropshires or Southdowns, and the Border-Leicester cross ewes were consistently superior to the Lincoln or Leicester crosses.—Sewall Wright.

1932. OSGOOD, WILFRED H. The turkey as a subject for experiment. Amer. Nat. 55: 84-88. 1921.—Author states that there is little genetic work under way "which can be correlated logically with the results of speciation and subspeciation as the field naturalist and taxonomist find them in nature." He thinks the 6 races or subspecies of the American turkey would furnish excellent material for this purpose. If it could be shown that the differences between these "behave as hereditary units without any such blending as requires 'dialectic gymnastics' to explain, it would be a long step forward in the correlation of natural and man-made experiments."—William A. Lippincott.

1933. PAYNE, FERNANDUS. Selection for high and low bristle number in the mutant strain "reduced." Genetics 5: 501-542. 3 fig. Nov., 1920.—In the 6th generation of selection for increase in scutellar bristles in a race of *Drosophila melanogaster* a male appeared with only a single bristle. Starting with the "reduced" strain originated by this fly, plus and minus selection lines were carried on by inbreeding for 60 and 65 generations, respectively, including counts of over 200,000 flies. As in results previously reported by author, in which similar selection lines were started from variations in wild stock, this selection isolated 2 distinct lines. The sorting process was clearly effective for about 18 generations, after which slight progress was made, although no somatic limit had been reached. Minus line continued to produce a few flies with 1 bristle; plus line, a few flies with no bristles. These 2 lines are shown to be genetically distinct by failure of return selections, by maintenance of their differences in mass cultures, and by crosses. It is concluded from linkage tests that a single sex-linked factor differentiates the "reduced" strain as a whole from wild strains; that plus and minus lines within the "reduced" strains differ genetically by 2 plus modifiers, 1 of which is in sex chromosome near miniature, the other in 3rd chromosome near sepia. These modifiers can be passed over to wild selection for high and low bristle number in *Drosophila*, and so produce an extra-bristle race. Author considers this investigation "another link in the chain of accumulating evidence in favor of the multiple-factor hypothesis as an explanation of the effects of selection in bisexual forms."—E. Carleton MacDowell.

1934. PELSENEER, PAUL. L'hybridation chez les mollusques. [Hybridization among mollusks.] Compt. Rend. Acad. Sci. Paris 168: 1056-1059. 1919.—Controlled observations of hybridization among mollusks, occasioned by designation in conchological literature of certain types of individuals as hybrids. In fluviatic forms copulation was observed in various combinations of *Limnaea*. Eggs, egg masses, embryos, and young exhibited exclusively maternal characters. Foreign sperm merely induces development without fertilization. Examination showed retention of an undivided polar body until gastrula stage. In reciprocal crosses of marine forms, *Pholas candida* (lamellibranch) \times *Patella vulgata* (gastropod), larvae conformed to maternal type. In reciprocal crosses of *Pholas candida* \times *Hermella*

alveolata (annelid), larvae were also exclusively maternal. Author concludes that true hybrids are not produced among mollusks. Even closely related and ill-defined species usually produce false hybrids exhibiting maternal characters, and only exceptionally are individuals found which appear to be true hybrids.—*R. E. Clausen*.

1935. PLOUGH, HAROLD H. Further studies on the effect of temperature on crossing over. *Jour. Exp. Zool.* 32: 197–202. 3 fig. 1921.—Since preliminary work on the 1st and 3rd chromosomes of *Drosophila melanogaster* had indicated that crossing over was not visibly affected by temperature changes, the author undertook experiments to determine why these chromosomes differed from the 2nd where a temperature above or below the optimum causes a significant increase in crossing over. The tests were made at a temperature of 31.5°C., and the crosses were between wild stock and mutant stocks of the 1st and 3rd chromosomes. The controls were kept at a temperature of 22–25°C. The F_1 were back-crossed to the original mutant stocks and the per cents of crossovers calculated. Practically the whole length of these 2 chromosomes was tested in this way. The experiments with the 1st chromosome showed that crossing over in this chromosome is not influenced by temperature or by the age of the female parent. The results with the 3rd chromosome were somewhat different. There was an increase in crossing over in this chromosome due to temperature, in only one region—the sepia-spineless. A variation in crossing over with the age of the female occurred also in this part of the chromosome only. Other regions of the chromosome were unaffected by temperature or age of the female parent. This same section, only, showed a relatively high rate of double crossovers. A similar phenomenon had been found to occur in the 2nd chromosome, where the region which showed high rate of double crossing over was influenced in the amount of crossing over by temperature or age of the female parent. The author interprets these results as indicating that regions where crossing over occurs less freely are the ones which are “sensitive” to the effects of environment.—*Mildred Hoge Richards*.

1936. RAWSON, H. E. Plant-sports produced at will. *Proc. Linn. Soc. London* 1919: 64–65. 1920.—Through “selective screening” experiments on various plants, such as *Tropaeolum majus* and *Papaver Rhoeas*, author claims to have secured sports and new varieties. By “selective screening,” the author refers to a system of screening plants at selected intervals of daylight. Variations produced by this method are said eventually to have become hereditary or “fixed,” that is, they appeared without “selective screening” in the open garden. A double variety of poppy is believed to have originated in this way. Sudden changes of color or structure were accompanied by sterility. “Selective screening” brings out latent potentialities and causes correlated variations. Work of GARNER and ALLARD [See Bot. Absts. 5, Entry 22] is said to support these views.—*Orland E. White*.

1937. RICHET, CHARLES, ET HENRY CARDOT. La transmission héréditaire des caractères acquis et l'accoutumance des microbes. [The hereditary transmission of acquired characters and the behavior of microorganisms.] *Compt. Rend. Acad. Sci. Paris* 171: 1353–1358. 1920.—A study of the resistance of lactic-acid bacteria to various chemical substances. A resistance was noted for potassium bromide, saccharose, vanadium, zinc, copper, and phenol; but the organisms became more and more sensitive to mercuric chloride. A specific resistance was developed in successive generations with respect to thallium nitrate, but this race was not resistant to other toxic substances. The development of resistance seems not to be a gradual process, but seems to occur suddenly in the manner of a mutation. These results seem to indicate that in the use of antiseptics, the same one should not be used continuously, but the different types should be alternated.—*Mrs. W. K. Farr*.

1938. RITZMAN, E. G. Breeding earless sheep. *Jour. Heredity* 11: 238–240. Fig. 31. 1920.—An account of the production of an earless type of sheep, at the New Hampshire Agricultural Experiment Station, by crossing 2 short-eared types. The short ears ranged below $2\frac{3}{4}$ inches in length and were formerly (*Jour. Agric. Res.* 6: 1916) reported to be the somatic expression of the pure dominant and of the heterozygote, assuming complete dominance. The later results reported show that the pure dominant is somatically earless and that the

short-eared type is the heterozygote. The earless type appeared in a cross between two short-eared parents.—*M. J. Dorsey.*

1939. SAFIR, SHELLEY R. Genetic and cytological examination of the phenomena of primary non-disjunction in *Drosophila melanogaster*. *Genetics* 5:459-487. 1 pl., 2 fig. Sept., 1920.—Females of *D. melanogaster* having the 2 sex-linked recessive mutants, eosin eye-color and miniature wings, were out-crossed individually to wild males. The regular offspring of such a cross are wild-type daughters and eosin miniature sons. In addition to these there were produced a few exceptions,—eosin miniature daughters and wild-type sons (245 such cultures yielded: Wild-type ♀ 25,004, *w^em* ♂ 22,454, *w^em* ♀ 17, wild-type ♂ 70). The occurrence of such exceptions had been explained by BRIDGES (*Genetics* 1: 1-52, 107-163. 1916) as due to primary non-disjunction of the X chromosomes, i.e., at the reduction division the 2 X chromosomes failed to disjoin, and both remained in the egg or both were extruded to the polar body. The XX type of egg fertilized by a Y sperm gives the matroclinous daughters, and the no-X egg fertilized by X sperm gives the wild-type exceptional sons. Bridges had found 12 such exceptions in a total of 20,484 flies, or a frequency of 1 in 1708. In the cross of eosin miniature female the frequency was 1 in 547, or 3 times as high. The excess was largely of males, which may be accounted for by "elimination" of both X chromosomes at maturation. That the above exceptions were due to primary non-disjunction (rather than to secondary non-disjunction caused by an extra Y chromosome in the mother) was proved in 3 ways: The percentage of exceptions in the individual cultures was significantly lower than that characteristic of XXY females; none of the regular daughters in the exception-producing cultures gave secondary exceptions, although half of them should have done so had the exceptions themselves been secondary; the exceptional sons were invariably sterile, as had been found by Bridges to be characteristic of primary exceptional males. The frequency of primary non-disjunction was tested for 2 other stocks, and was found to give 1 exception in 1453 in the white, and 1 in 1210 in the vermilion. The tests of Bridges and of Safir gave a total of 180,022 flies of which 163, or 1 in 1104, were primary exceptions. It seems probable that the relatively high percentage of exceptions given by the eosin miniature stock was due to a recessive genetic difference. The fact that the primary exceptional male is sterile was proved by extensive tests. Microscopical examination of the testes showed that sperm was scanty and non-motile. The cytoplasm of the cysts was found to be syncytial; the compactness of the bundles of sperm and their non-motility may be a consequence of this difference. The constitution of the primary exceptional males was proved to be XO by direct cytological examination; the spermatogonial cells, in the few clear cases, contained an unpaired rod-shaped X chromosome, with no J-shaped Y chromosome present.—*Calvin B. Bridges.*

1940. SAUNDERS, E. R. On conceptions of the processes of heredity. *Nature* 106: 224-227, 255-258. 1920.—Reduplication theory of BATESON and PUNNETT is contrasted with chromosome theory of MORGAN—the latter reviewed in considerable detail. Case is cited of double-throwing Stocks, which is taken as typical of numerous instances in plants where factorial segregation appears to be premeiotic. Significance of cytoplasm vs. nucleus in hereditary mechanisms is discussed. The author reaches the following general conclusions: Special hereditary processes cannot be attributed to cytoplasm as distinct from nucleus; there is little doubt that in animals the chromosomes represent distributional mechanism, and similarly in plants for such cases as *Drosera*, *Primula*, *Oenothera*, etc.; general applicability of conception of crossing-over is doubtful; in plants, as contrasted with animals, segregation may take place elsewhere than at the recognized reduction division.—*T. H. Goodspeed.*

1941. SEARS, PAUL B. Variation in *Taraxacum*. *Science* 53: 189. 1921.—The suggestion is made that the variation in the amount of dissection of leaves in *Taraxacum* is correlated with age of rosette.—*A. K. Peitersen.*

1942. STAPLEDON, R. G. Plant breeding work at Aberyswyth. *Jour. Ministry Agric. Great Britain* 27: 630-639. 1920.—A popular discussion.—*H. K. Hayes.*

1943. STOUT, A. B. A graft chimera in the apple. Jour. Heredity 11: 233-237. Fig. 28. 1920.—Two types of apples appear on a tree which has never been top-grafted. One type is typical of King and the other is nearly identical with the Roxbury Russet. Chimeral fruits having a King sector with the remainder Russet furnish evidence that this instance is not due to top-working. Mixed tissues are also found in twigs and leaves. It is probable that this chimera developed from a bud that arose on the line of contact between scion and stock and is hence to be considered a graft-chimera. It is possible that some of the fruits show a periclinal relationship.—M. J. Dorsey.

1944. STURTEVANT, A. H. Genetic studies on *Drosophila simulans*. I. Introduction. Hybrids with *Drosophila melanogaster*. Genetics 5: 488-500, 5 fig. Sept., 1920.—Author relates circumstances leading to the discovery of *D. simulans* Sturtevant as a species common and very similar to *D. melanogaster* Meigen. He describes differences between the 2 species, and presents the results of crosses between normal males of each species mated to females of the reciprocal species. Normal females were used, and also females that, as a result of non-disjunction, carried a Y chromosome as well as the two X chromosomes. Odd sex ratios are usual in the progeny of all matings between these species. The following postulate is found to account for the results: "In general, it appears that hybrids develop only if they carry a *simulans* X, but that in the presence of *simulans* cytoplasm a *melanogaster* X usually inhibits development even though a *simulans* X is also present." The hybrids are intermediate to their parents in appearance and are sterile. Author describes distributional range of *D. simulans*, comments on sex ratios in hybrid progeny of other groups of animals, and closes with a paragraph on sexual selection in these species of *Drosophila*.—John S. Dexter.

1945. SWINGLE, WILBUR WILLIS. The germ cells of Anurans. I. The male sexual cycle of *Rana catesbeiana* larvae. Jour. Exp. Zool. 32: 235-331. 15 pl., 2 fig. 1921.—The present paper is the first of a series upon the history of germ-cells of Anurans. Sexual cycles are described in male tadpole of bull-frog, *Rana catesbeiana*, which usually exists as tadpole for 2 years. Two cycles occur, the 1st during the 1st year, the 2nd during the 2nd year, just before metamorphosis. Germ-cells of 1st cycle arise from primordial germ-cells, pass through maturation stages as far as metaphase of 1st division, after which the cells degenerate at once or form spermatid-like cells which degenerate. The 28 chromosomes and 14 tetrads strikingly duplicate those of the Urodeles in their appearance, size, and behavior. The 2nd cycle takes place in cells which are products of prolific and rapid multiplication of a few primordial germ-cells which did not participate in the 1st cycle, and possibly also of germinal epithelial cells. This cycle gives rise to normal mature sperm at time of metamorphosis. These cells and their chromosomes are much smaller than those of 1st cycle and are typical of adult Anurans; this difference is due possibly to rapid succession of divisions producing them, and to loss of water in metamorphosis. Metamorphosed males continue to produce sperm until large enough to copulate. Author predicts a similar abortive cycle for female, now under investigation. A still more precocious abortive cycle for *Rana pipiens* and the toad is reported. History of germ-cells of other vertebrates which also possess an abortive cycle is reviewed. These precocious abortive cycles are interpreted as another case of "recapitulation of the germ-cell cycle to past phylogenetic sexual conditions when vertebrates ripened their sexual products at an earlier developmental stage than at present." The above history is an important consideration among Europeans in determining the sex of tadpoles, which is also to be discussed later.—C. L. Parmenter.

1946. SWINGLE, WILBUR WILLIS. Neoteny and the sexual problem. Amer. Nat. 54: 349-357. 1920.—The present paper is preliminary to a series of papers upon sex of Anuran tadpoles and their sexual cycle. From a study of the gonads of tadpoles of *Rana catesbeiana* (bull-frog) which metamorphoses usually during the 2nd year, author concludes that R. HERTWIG, KUSCHAKEWITCH, and WITSCHI misinterpret meaning of sexual cycle in European frogs, that the tadpoles are not at first largely females with a few hermaphrodites,—from both of which males later develop,—but that both male and female tadpoles exist in equal numbers. Error exists in the assumption that the behavior of tadpole germ-cells parallels

that of many mammals in which the female cells undergo early stages of maturation before birth, while those of males delay until near sexual maturity. Author observes that both male and female tadpoles undergo early maturation stages simultaneously. Cells of male undergo 2 cycles: First cycle during 1st year reaches 1st maturation division and aborts; 2nd cycle during 2nd year produces mature sperm just before metamorphosis. Pachytene cells of female tadpole enter growth stage and become typical oocytes. So-called "oocytes" in male tadpole and newly metamorphosed frog arise during growth stage but later degenerate. Presence of yolk-bearing cells is not a good sex criterion since male cells of *Ascaris* and the Prosobranchs form yolk. Author suggests that "oocytes" are of same nature as cells of Bidder's organ, that due to precocious sexual cycle some germ-cells not able to complete their cycle grow to an abnormal size and appear as oocytes.—*C. L. Parmenter.*

1947. THOMPSON, DAVID H. A new type of sex-linked lethal in *Drosophila*. [Abstract.] Anat. Rec. 20: 215. 1921.—A new sex-linked recessive factor has appeared which kills females in double dose and can be recognized in the males which it does not kill. In these males it affects the mesothorax since the wings are held erect and the 2nd pair of legs is feeble. Crosses between heterozygous females and erect males give a sex ratio of 1 female to 2 males while other lethals give ratios of 2 females to 1 male. Linkage experiments indicate a locus of about 38 in the sex chromosomes. The lethal effect and the character "erect" are manifestations of the same factor as indicated by the absence of crossing over between the two. This erect lethal kills females homozygous for it while other sex-linked lethals kill males. The possibility is offered of producing balanced lethals in the sex chromosomes. Recently a dominant accessory factor has appeared which makes erect dominant in the heterozygous females.—*David H. Thompson.*

1948. THOMSON, J. ARTHUR. [French rev. of: CASTLE, W. E. Studies of heredity in rabbits, rats and mice. Carnegie Inst. Washington Publ. 288. 56 p., 3 pl. 1919.] Scientia 29: 142-144. 1921.

1949. THOMSON, J. ARTHUR. [French rev. of: MORGAN, T. H., AND OTHERS. Contributions to the genetics of *Drosophila melanogaster*. Carnegie Inst. Washington Publ. 279. 388 p., 12 pl., 105 fig. 1919.] Scientia 29: 144-145. 1921.

1950. TISCHLER, G. [German rev. of: OSTENFELD, C. H. Kimdannelse uden befrugtning og Bastarddannelse hos nogle Kurvblomstrede samt disse Forholds Betydning for formernes constans. (Studies on fertilization and hybridization in Compositae and their significance for the production of constant forms.) K. Vet. og Landbohjskole Aarskr. 1919: 207-219. 1 fig. 1919.] Zeitschr. Indukt. Abstamm.- u. Vererb. 25: 176. 1921.

1951. WEINSTEIN, ALEXANDER. Homologous genes and linear linkage in *Drosophila virillis*. Proc. Nation. Acad. Sci. 6: 625-639. 2 fig. Nov., 1920.—Author describes "cross-veinless," a sex-linked mutant character in *Drosophila virilis* which constitutes a 3rd possible parallel to sex-linked characters in *Drosophila melanogaster*. Data are given on linkage of factors for crossveinless and hairy with other factors; also evidence of linear linkage as opposed to 3-dimensional linkage in this species. Data are presented on coincidence, indicating that coincidence resembles that in X chromosome of *D. melanogaster*. Author discusses question of "homology of apparently similar factors" and answers the question "are genes with similar somatic effects chemically similar?" in the negative.—*C. W. Metz.*

1952. WELLINGTON, R. Recent investigational work with the tomato. Trans. Peninsula Hort. Soc. [Delaware] 9: 73-76. 1920.—Author notes that F_1 seed usually gives a greater yield than either parent and produces a uniform product. An objection is that crossed seed must be used each season. Method of producing crossed seed is given.—Work of previous investigators is reviewed, all of whom obtained increased yields in F_1 over the parent varieties.—In experiments conducted at Minnesota, 1911-1918, the average increase was nearly 4 pounds per plant, including green and ripe fruit, but not all crosses were equally productive,

nor did all give the same increase each season. Smoothness and earliness are additional factors noted as a result of the cross.—Important difference between yield of same strain in different years is noted, also the importance of regulating plantings to suit weather conditions. Author cites results secured with wilt-resistant varieties originated by the United States Department of Agriculture and the Maryland Agricultural Experiment Station.—*C. E. Myers.*

HORTICULTURE

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H. E. KNOWLTON, *Assistant Editor*

(See also in this issue Entries 1584, 1595, 1599, 1705, 1712, 1724, 1811, 1824, 1858, 1891, 1910, 1922, 2002, 2013, 2101, 2112, 2120, 2122, 2129, 2138, 2181, 2189, 2192, 2223, 2249)

FRUITS AND GENERAL HORTICULTURE

1953. ANONYMOUS. **Apple—Maidstone Favorite.** Jour. Pomology 1: 61-62. Pl. 1. 1919.—A technical description of a promising variety of apple originating as a seedling and raised by Messrs. George Bunyard and Co., Ltd.—*L. H. MacDaniels.*

1954. ANONYMOUS. **The first year under quarantine.** Amer. Nurseryman 33²: 32, 35. 1921.—A report is given on the working of Quarantine 37 for the first year of its operation. Data show that there were practically as many fruit stocks imported under the quarantine measure as during the year previous. While such stock is not under quarantine, it however refutes the argument that foreign growers had refused to sell to American importers as a retaliation for Quarantine 37. Data and other facts regarding the law are incorporated in this report.—*J. H. Gourley.*

1955. ANONYMOUS. **The patenting of new fruits.** Jour. Pomology 1: 50-53. 1919.—There is a strong movement in France to pass laws giving the originator of a new variety exclusive rights to its propagation for a period of years as a recompense for his labor. Such a movement is objected to because in the case of fruits it would be impossible in many cases to tell whether the variety is new or merely an old one rediscovered, or a seedling which has come true to type. It is of greater advantage to the originator to have the advertisement that comes from the introduction of his discovery by well established nurseries than to have the temporary financial gain from independent propagation.—*L. H. MacDaniels.*

1956. ANONYMOUS. **The pomological conference at Metz, Sept. 4th, 1919.** Jour. Pomology 1: 59-61. 1919.—A short account of the conference, with brief comment.—*L. H. MacDaniels.*

1957. ANONYMOUS. **A review of "Fruit Culture and Science."** By the Duke of Bedford and Spencer Pickering. [Macmillan and Co.: London, 1919. xix + 348 p., 47 fig.] Jour. Pomology 1: 41-49. 1919.—A summary of the book in question with some adverse criticism of the manner of conducting the experiments and the interpretation of data. The author is further criticized for not giving sufficient weight to the effect of stock on scion and variation in the growth habit in varieties. The criticism is for the most part favorable. The part played by Mr. Pickering in horticulture is likened to that played by Bernard Shaw in politics and ethics. Whatever else he may have done he has aroused us from our lethargy.—*L. H. MacDaniels.*

1958. BECKWITH, CHARLES S. **A complete cranberry fertilizer for Savanna bottom.** Proc. Ann. Meeting Amer. Cranberry Growers' Assoc. 50: 5-7. 1920.—As a result of tests extending from 1913 to 1918 the following tentative formula for a fertilizer for cranberries on Savanna land is advised: 75 lbs. nitrate of soda, 75 lbs. dried blood, 300 lbs. rock phosphate, and 50 lbs. sulphate of potash. In 1919, tests were made with different amounts per acre of this mixture with varying amounts of acid phosphate. The heaviest yield followed an application

of 800 lbs. of the above mixture with 150 lbs. acid phosphate, a 24 per cent increase over the unfertilized plot. Increasing the amount to 1050 lbs. plus 800 lbs. acid phosphate increased the yield only 12 per cent, and the berries were oversized and soft.—*J. K. Shaw.*

1959. BERGMAN, H. F. Observations on the accumulation of carbon dioxide from strawberries in refrigerator cars. *Science* 53: 23. 1921.—During the years 1918 and 1919 the writer made observations on the CO₂ and O₂ content of air in refrigerator cars, and the effect of ventilation on the accumulation of CO₂. In the tests of 1918, berries were loaded at a temperature of about 68–70°F., and one car was ventilated by raising the hatches at diagonal corners of the car. In the tests of 1919, the berries were loaded at a temperature of 76–78°F., and one car was ventilated by raised hatches. From the table it is apparent that there is no great accumulation of CO₂ in the air of unventilated cars in transit. The maximum of 2.5 per cent dropped to 0.7 per cent when the car was iced, and again increased to 1.3 per cent, never exceeding this amount during the remainder of the journey. In ventilated-refrigerator cars the percentage of CO₂ is lower. It may, while the cars are standing, become nearly or quite as great as in unventilated cars, but when the cars are moving it drops to 0.2–0.4 per cent. It is concluded that the accumulation of CO₂ in unventilated refrigerator cars is apparently not sufficient, in the case of strawberries, to cause injury to the berries.—*A. H. Chivers.*

1960. BERGTHOLDT, J. E. President Bergtholdt's address to the Californians. *Amer. Nurseryman* 33: 8. 1921.—This address consists largely of suggestions for the betterment of the California Association of Nurserymen but it includes statements to justify the high price of nursery stock. Data are presented to show that California-grown fruit trees are cheaper than eastern-grown stock of the same size and quality.—The nurserymen cannot, on the average, secure a yield of trees greater than 70 out of 100 planted, and out of the 70 not more than 49 will, over a period of years, be sold. This loss of over 50 per cent must be absorbed by the trees that are actually sold; this in part explains the high price of nursery stock.—*J. H. Gourley.*

1961. BUNYARD, EDWARD A. The length of stem in pears and apples. *Jour. Pomology* 1: 20–22. 1 fig. 1919.—Fruits borne at the center of a cluster, in the case of apples, or at the tip of the cluster base, in the case of pears, have shorter stems than those borne laterally. The great variation in the length of stem within a variety renders this character of little value in the classification of varieties.—*L. H. MacDaniels.*

1962. BUNYARD, EDWARD A. Seedling apples—a record of some growers' experiences. *Jour. Pomology* 1: 110–115. 1920.—A discussion of some of the results of apple breeding experiments in England, Canada, and the United States. It is concluded that most of the varieties that have been used in crossing behave as if genetically pure, and transmit their characters to the seedling. A method of bringing seedlings into early bearing by cutting the tap root is briefly described.—*L. H. MacDaniels.*

1963. CHAMBERS, F. S. Report of the research committee of the American Cranberry Growers' Association. *Proc. Ann. Meeting Amer. Cranberry Growers' Assoc.* 50: 7–10. 1920.—Investigations conducted since 1913 appear to indicate that various cranberry soils have different degrees of acidity. Cranberries will grow well in soils of slight acidity, also in soils that are very acid. Red-root (*Ceanothus americanus*) and double-seeded millet can apparently tolerate a greater acidity than the cranberry.—*J. K. Shaw.*

1964. CHASSET, L. En culture fruitière intensive: croisillon et gobelet nain; comparaison des deux formes. [Comparison of the cross-bar and dwarf-goblet forms in intensive fruit culture.] *Rev. Hort.* 92: 191–192. 1920.—When spaced 2 meters apart, the cross bar type of tree would possess, when developed, 33,200 meters of wood capable of carrying fruit-spurs, whereas the goblet type would possess 50,000 meters. On rich soils, however, it would be necessary to space the goblet-form trees 3 meters apart, in which case the length of spur-producing wood would be reduced to 33,000 meters, but all of this would be advantageously

exposed to light and air. The latter type is a desirable form for plum, cherry, and peach trees.—*E. J. Kraus.*

1965. DURHAM, H. E. The recognition of fruit—graphic records. *Jour. Pomology* 1: 28–36. *Fig. 2–4.* 1919.—The author emphasizes the necessity of uniform and accurate methods in making graphic records in the description of varieties of apples and pears. Longitudinal, transverse, and crown sections should be made, the last named to pass through the blossom end just below the calyx. The calyx, calyx tube, position of stamens, core fruit, and “axial sac,” or intercarpellary space, are considered to be important characters. A method for tracing fruit outlines without cutting specimens is given.—*L. H. MacDaniels.*

1966. GOULD, W. M. Production of nursery stock. *Amer. Nurseryman* 33²: 44, 46. 1921.—A detailed discussion of the practices in the nursery.—*J. H. Gourley.*

1967. GUILLAUMIN, A. Citranges, limonanges, satsumanges. *Rev. Hort.* 92: 157–159. *Fig. 54.* 1920.—The author characterizes further some of the known *Citrus trifoliata* crosses and summarizes those known to date as follows: *Triptera* × *Bigaradier* = Citrange stock; Orange × *Triptera* = Citranges Armand Bernard, Rusk, Montauban improved; *Triptera* × Orange = Willist citrange; Lemon × Citrange = Montauban Limonage; *Triptera* × *Satsuma* = Norman Satsumange; Citrange × Citrange. [See also *Bot. Absts.* 7, Entry 1911.]—*E. J. Kraus.*

1968. HATTON, RONALD G. Black currant varieties—a method of classification. *Jour. Pomology* 1: 65–80, 145–154. *Fig. 5–15, 17–26.* 1920.—All varieties of black currant are derived from the single species *Ribes nigrum* Linn. The nomenclature of the horticultural varieties has been greatly confused. It is important to correct this because of the great variation in the varieties as to disease and pest resistance, bearing, adaptability to soil types, etc. Varieties are divided into the “red bud” and “whitish bud” types on the basis of bud color, and each type into two groups on the basis of growth habit, bud characters, season of flowering, and minor differences in inflorescence, flower, leaf, and fruit. The most prolific variety is the Baldwin, which has as its chief defect susceptibility to gall mite infection.—A review of literature is included.—*L. H. MacDaniels.*

1969. HEINE. Düngungsversuche im Obstbau. [Fertilizer experiments in fruit culture.] *Mitteil. Deutsch. Landw. Ges.* 36: 97–100. 1921.—A general discussion of facts to be considered in carrying on fertilizer experiments with fruit trees. From experiments conducted at Dahlem, the author concludes that at least 12 trees should be selected for every treatment proposed.—*A. J. Pieters.*

1970. HOOPER, CECIL H. Notes on insect visitors to fruit blossoms. *Jour. Pomology* 1: 116–124. 1920.—Honey bees are the most frequent visitors of fruit blossoms of all kinds in England. In the case of apple blossoms they comprise about 70 per cent of the visitors, bumble bees, other wild bees, and flies being next in order. Bees, because of their hairy coats, are considered better pollen carriers than beetles or ants. Lists of insects visiting fruit blossoms in Germany are copied from the work of Hermann Müller.—*L. H. MacDaniels.*

1971. KEEBLE, FREDERICK. Intensive cultivation. *Nature* 106: 293–296. 1920.—Production of vegetables, fruits, and potatoes under war time conditions is discussed.—*O. A. Stevens.*

1972. LAXTON, EDWARD. On raising seedling apples. *Jour. Pomology* 1: 104–109. 1920.—A brief account of the apple breeding work of the author and his brother. About 500 crosses were made and 5000 seedlings raised. Eighty of the most promising crosses are listed and briefly described. Many of the seedlings have much of the flavor and quality of Cox's Orange, a variety used in most of the dessert crosses. Crossing dessert and cooking varieties was found unsatisfactory in practically every case.—*L. H. MacDaniels.*

1973. MERCIER, C. **The electrification of seeds.** Sci. Prog. [London] 13: 482-485. 1919.—More than 2000 acres have been planted with electrified seeds of different kinds. This treatment has been found to be very beneficial and has resulted in an increase in yield, in weight per bushel of the seed, in the length and strength of the straw, and in the number of plants from each seed. Every kind of seed requires a special treatment, the details of which have not all been worked out. The rationale of the process is unknown.—*J. L. Weimer.*
1974. MOREL, F. **Vignes des jardins et raisins de table.** [Garden vines and table grapes.] Rev. Hort. 92: 219. 1920.—Attempts to produce grape vines resistant to attacks by fungi and at the same time productive of high quality fruits are meeting with fair success. The selection of new forms should be severe, retaining only the best.—*E. J. Kraus.*
1975. POPENOE, WILSON. **The Colombian berry or giant blackberry of Colombia.** Jour. Heredity 11: 195-203. Fig. 1-4. 1920.—An account of a hitherto unknown species of *Rubus* from Colombia, South America, of great interest to horticulturists and fruit breeders. The fruit sometimes reaches a length of $2\frac{1}{4}$ inches and the plant makes a strong vigorous growth. The color of the berry is light crimson turning to a wine color when overripe. The quality is not high but selection may bring out superior varieties. While the species has not been determined it was thought to be *R. roseus*. The plant prefers a moist, cool climate and will probably be of most value in the southern states in the U. S. A.—*M. J. Dorsey.*
1976. RIDER, A. J. **Studies in cranberry culture.** Proc. Ann. Convention Amer. Cranberry Growers' Assoc. 51: 1-3. 1920.
1977. ROSS, J. C., AND S. W. VAN NIEKERK. **The manuring of vineyards.** Jour. Dept. Agric. Union of South Africa 2: 163-169. 1921.—Various formulae, all calculated to supply standard quantities of nitrogen, phosphoric acid and potash are given with costs. Attention is called to the fact that different soils vary in fertilizing requirement and a simple plan is suggested by which the vineyardist may test the needs of his own soils. On sour soil lime is needed.—*A. J. Pieters.*
1978. TABOURY, M. F. **Injections dans les plantes pour augmenter leur rendement.** [Injections in plants to increase fruit returns.] Nat. Canadien 47: 145-146. 1921.—An old pear tree which flowered but did not fruit was subjected to the following treatment: A little above the ground the trunk was perforated to the vascular bundles, and a small glass tube inserted communicating with 18 l. of a solution containing 19 gr. FeSO_4 and 10 gr. NaNO_3 ; the tree absorbed the solution in about 3 days. The following month the leaves were larger and more vigorous than those of 2 untreated trees, and the tree produced numerous fruits, while the control trees produced none.—In 1913, M. CALVINO similarly employed on a sterile pear tree the following solution: H_2O 20 l., super-phosphate 5 gr., K_2SO_4 5 gr., NaNO_3 5 gr., and FeSO_4 5 gr. The tree absorbed 50 l. of the solution just before flowering, with good effect in flowers and fruitage. A lilac grafted on privet and similarly treated, had a much more vigorous and abundant bloom than usual.—*A. H. MacKay.*
1979. TERRY, H. B. **Pruning of deciduous fruit trees.** Jour. Dept. Agric. Union of South Africa 2: 177-184. 1921.—Practical directions, with illustrations, for pruning so as to give trees the "goblet" or "vase" form said to be the best form for South African conditions.—*A. J. Pieters.*
1980. TRIBOLET, I. **The pecan nut.** Jour. Dept. Agric. Union of South Africa 2: 129-132. 1921.—The culture of the pecan nut is discussed and it is suggested that the growing of the pecan might prove highly remunerative in parts of South Africa, especially in Natal.—*E. M. Doidge.*

1981. TRIBOLET, I. **Walnuts.** Jour. Dept. Agric. Union of South Africa 2: 80-81. 1921.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

1982. ANONYMOUS. **The American holly.** Nation. Nurseryman 29²: 33. 1921.—This plant has withstood the smoky atmosphere of St. Louis better than most other plants. "For a city evergreen the holly is therefore recommended above all other evergreens on account of its smoke-resisting qualities."—Attention is called to the general dioecious habit of the plants and the consequent necessity of planting staminate and carpellate trees close together in order to secure pollination.—*J H Gourley.*

1983. ANONYMOUS. **Native plants at the National Botanic Gardens.** South African Gard 11: 11, 45. 3 fig. 1921.

1984. ANONYMOUS. **Note.** [Rev. of: PEMBERTON, J. H. *Roses: their history, development and cultivation.* 2 ed., xxiv + 334 p., 9 pl. Longmans Green and Co.: London, 1920.] Nature 106: 371. 1920.

1985. ALBERT, C. **Le fenouil de Florence: Il Fenocchio.** [Fennel from Florence, Il Fenocchio.] Rev. Hort. 92: 220. Fig. 56. 1920.—Differing from the common fennel, the leaf bases of this variety produce a scaly bulb, the interior of which is tender and edible. It is used in either the cooked or uncooked state. Seeds sown in March produce marketable plants in June and July, while those sown in September yield large plants the following April.—*E. J. Kraus.*

1986. ENFER, V. **Chauffage des serres: les lignites et la tourbe.** [Heating greenhouses: lignites and peat.] Rev. Hort. 92: 218-219. 1920.—Both of these materials may be used as substitutes for coal, the latter when used in conjunction with coal or when made into briquettes, is a good fuel. Large quantities of peat are available at many places in France.—*E. J. Kraus.*

1987. ENFER, V. **Utilisation des serres avec chauffage: production des légumes.** [Utilization of greenhouses with heat: production of vegetables.] Rev. Hort. 92: 195-196. 1920.—Specific suggestions on growing various crops.—*E. J. Kraus.*

1988. GADECEAU, E. **Le drapeau belge: Abutilon megapotamicum.** [The Belgian flag—A. megapotamicum.] Rev. Hort. 92: 214-215. 1 pl (colored). 1920.—This form is dedicated to King Albert I of Belgium because the colors of the flower are arranged as are those of the Belgian flag; the calyx is red, the corolla yellow, and the stamen mass brown-black. The plant is free flowering and of easy culture.—*E. J. Kraus.*

1989. HEEDE, A. VAN DEN. **Les plantes vivaces et rustiques: les juliennes a fleurs doubles.** [Perennial and hardy plants: double flowered Hesperis.] Rev. Hort. 92: 198. 1920.—The single flowered forms of *Hesperis matronalis* generally persist from year to year. The white, double flowered form, however, usually dies out the 2nd year following planting. This difficulty can be completely avoided by dividing the old plants in August, or by making cuttings from the stems, and transplanting to a new situation.—*E. J. Kraus.*

1990. KRELAGE, E. **Nouvelles tulipes hybrides.** [New hybrid tulips.] Rev. Hort. 92: 196-197. 1 pl (colored). 1920.—Systematic hybridizing of tulips was undertaken 20 years ago. Crossing *Tulipa retroflexa* with a rose colored Darwin tulip resulted in a variety, Sirène, with distinctly reflexed petals, flowering for the first time in 1908. Other varieties with similar lily-like flowers, in various colors, are being produced each year. Three other distinct groups of varieties are listed as follows: (1) Pure white forms particularly adapted for forcing; (2) forms possessing absolutely new colors or attractive combinations of colors; (3) yellow varieties of the true globular Darwin type, of which none existed previously. Many of the varieties are still on trial, many hundreds have been discarded, and each year many new seedlings bloom for the first time.—*E. J. Kraus.*

1991. LAMBERT, F., ET P. PÉRONNE. *Le Tchè* (*Cudrania Triloba*, Hance). [*Cudrania triloba*.] Ann. École Nation. Agric. Montpellier 17: 81-104. Fig. 1-10. 1918 [1919].—*Cudrania* is a small tree or shrub with thorns. It was found that the mulberry silk worm which eats the leaves of *Cudrania* is less susceptible to disease. Its roots contain a yellowish-red coloring matter which can be easily extracted. As a hedge plant it is valuable because of its thorns. It thrives where the mulberry grows but prefers deep cool sandy soil. It is propagated easily by root cuttings or by layering.—F. F. Halma.

1992. LESOURD, F. *Trois nouveaux lauriers roses*. [Three new oleanders.] Rev. Hort. 92: 216-217. Fig. 56-57. 1920.—The varieties Rochelais, Single Crimson; Botaniste Faideau, Double Rosy White, with the backs of the petals rose lilac; and Aunissien, double rose lilac, are described and the characteristics noted.—E. J. Kraus.

1993. MOTTET, S. *Un nouveau Liquidambar, L. formosana Hance*. [A new Liquidambar.] Rev. Hort. 92: 192-194. Fig. 55. 1920.—This species, though long known botanically, has scarcely been used as an ornamental. The young trees grow rapidly, develop attractive colors in autumn, and should prove useful along avenues or in groups.—E. J. Kraus.

1994. PHILLIPS, E. P. *Crotalaria Agatiflora*, Schwenif. South African Gard. 10: 457. 1 fig. 1920.

1995. ROLET, A. *Le froid artificiel régulateur des marchés dans le commerce des fleurs coupées*. [Refrigeration, a regulator of the cut flower trade.] Rev. Hort. 92: 190-191. 1920.—The need, expense, and use of precooling stations and refrigerator cars are discussed.—E. J. Kraus.

1996. VACHEROT, M. *Vanda Sanderiana*. Rev. Hort. 92: 213-214. Fig. 55. 1920.—Historical and cultural notes.—E. J. Kraus.

1997. WARNAAR, W., EN YAN ROES. *Verslag van de Commissie bot het bestudeeren van den toestand van den bloembollenteelt in Engeland*. [Report of the committee to study bulb raising in England.] Weekbl. Bloembollencult. 30: 13-16. 1919.—The reports of a series of studies on bulb growing in England are given, especially with reference to the culture, pests, and diseases.—J. C. Th. Uphof.

1998. WYMAN, L. *Tree planting in Texas towns and cities*. Texas Agric. Exp. Sta. Forest. Bull. 11. 39 p., 10 fig. 1920.—Information is given as to kinds of trees adapted to wide and narrow streets, to open lawns, and to different sections of the state.—A map of the state showing counties is divided into 5 regions. Trees suitable for each region are listed.—A table of 83 trees is given, listing the common name, scientific name, rate of growth, length of life, value for street planting, width of street to which adapted, and desirable features. A few pages are devoted to the care of the tree, diseases, and pruning.—Texas dealers in shade trees are listed.—L. Pace.

VEGETABLE CULTURE

1999. LAMPROY, E. *Culture de la pomme de terre dans la mousse*. [Potato culture in moss.] Rev. Hort. 92: 214. 1920.—Tubers of early varieties placed in pots of fresh moss and kept moist by watering every 2 or 3 days will yield a few tubers in about 1½ months. No fertilizer is used. The method is for amateurs only.—E. J. Kraus.

2000. WEIRUP. *Gemüsesorten*. [Varieties of vegetables.] Mitteil. Deutsch. Landw. Ges. 35: 663-664. 1920.—The author gives a list of the best varieties of peas, beans, carrots, cabbage, and onions.—A. J. Pieters.

2001. YOUNGKEN, HEBER W. *Studies on the Cassaba and Honey Dew melons*. Amer. Jour. Pharm. 93: 104-115. Fig. 12. 1921.—An investigation into the origin, history, struc-

ture, and chemical constitution of two cucurbitaceous fruits, namely, "Cassaba" and "Honey Dew Melon." Both melons undoubtedly belong to the group known as the *Inodorous* variety of *Cucumis melo*. This species contains an extraordinary number of varieties and strains, arranged in ten groups as follows: Canteloups, brodes, sucirins, melons d'hiver, ser-pents, forme de concombres, Chito, Dudain, rouges de Perse, and sauvages; each of these groups contains varieties or nearly allied races. The Cassaba melon, also known as "Kas-saba," "Casaca," "Casabad," and "Casba," was named for the town of Kassaba, about 15 or 20 miles from Smyrna, where it was extensively grown and whence it was introduced into this country. Hundreds of acres are now grown each year in the San Fernando valley of southern California. The Honey Dew melon is an old renamed winter melon from the south of France. It is grown quite extensively at the present time in Colorado. The paper is well illustrated by a series of photographs of the entire fruits and of fruits in cross section, as well as a number of sketches of the histological characteristics. A chemical analysis is also included.—*Anton Hogstad, Jr.*

MORPHOLOGY, ANATOMY AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 1826, 1869, 1888, 1905, 2001)

2002. BLAUW, A. H. Over de periodiciteit van *Hyacinthus orientalis*. [On the periodicity of *Hyacinthus orientalis*.] Mededeel. Landbouwhoogeschool Wageningen 17: 1-82. Pl. 1-5, fig. 1-46. 1920.—The periodic development in leaf formation, flower formation, and the extension of rest periods are considered. During the leaf-formation period in April a bud lies against the flower stalk, implanted on the disc in the axil of the innermost of the assimilating leaves. The earliest evidence of the bud dates from the end of the July of the previous year, and this bud forms the leaves which will function 2 years later. It consists of a few leaf primordia round a growing point. Of these, the 2 outer will not develop into foliage leaves but into scale leaves, remaining in the bulb. Such scale leaves and the basal parts of the foliage leaves become scales of the bulb.—Flower formation takes place during the leaf forming period in June, and the growing apex at that time is still low and flat. After the leaves and roots have died and the bulbs have been dug, the growing point of the inflorescence rises and reaches a length of 300-400 μ . No outward differentiation is visible. Soon the flower primordium appears as a shallow groove on the wall which is to become the bract. At the end of August several flower primordia appear, each with a floral bract. At the beginning of September the 3 carpels are differentiated but are still open; they close at the end of September. During late October, the reduction division of pollen mother cells takes place. In dry-lying bulbs, a resting period now takes place. Low temperature during the growing season greatly retards the development of floral and vegetative parts.—*J. C. Th. Uphof.*

2003. CAMMERLOHER, HERMANN. Der Spaltöffnungsapparat von *Brugmansia* und *Rafflesia*. [The stomata of *Brugmansia* and *Rafflesia*.] Österreich. Bot. Zeitschr. 69: 153-164. Pl. 3, fig. 1-5. 1920.—Stomata are present in lower epidermis of perianth in both forms, absent on other leaves. Upper surface is composed of small irregular cells, with occasional hairs; lower epidermis is smooth, with distinct layers of cuticle. Stomata of *Brugmansia* have 2, 3, or 4 guard cells; those of *Rafflesia* are typically 4-celled. Many stomata are abortive and it was not determined whether any performed functions of stomata or not.—*E. M. Gilbert.*

2004. COULTER, J. M. Embryogeny in angiosperms. [Rev. of: SOUÈGES, R. (1) Embryogénie des Liliacées. Développement de l'embryon chez l'*Anthericum ramosum*. (Embryogeny of the Liliaceae. Development of the embryo of *Anthericum ramosum*.) Compt. Rend. Acad. Sci. Paris 167: 34-36. 1918 (see Bot. Absts. 2, Entry 484). (2) Embryogénie des Poly-

gonacées. Développement de l'embryon chez le *Polygonum Persicaria*. (Embryogeny of the Polygonaceae. Development of the embryo in *Polygonum Persicaria*.) Compt. Rend. Acad. Sci. Paris 168: 791-793. 1919 (see Bot. Absts. 5, Entry 581).] Bot. Gaz. 68: 486. 1919.

2005. CUTTING, E. M. [Rev. of: CHURCH, A. H. On the interpretation of phenomena of phyllotaxis. Bot. Mem. [Oxford] 6. 58 p. 1920 (see Bot. Absts. 9, Entry 337).] Sci. Prog. [London] 15: 148. 1920.

2006. GATIN, V. C. Recherches anatomiques sur le pédoncule et la fleur des Liliacées. [Anatomical investigations of the peduncle and flower of the Liliaceae.] Rev. Gén. Bot. 32: 561-591. Fig. 56-60. 1920.—The final chapters of the investigations previously reported are here given. They comprise a study of the subfamilies Dracenoideae and Colchicoideae together with a summary of the relationships within the Liliaceae, and between this group and the neighboring families Juncaceae, Dioscoreaceae, Haemodoraceae, Amaryllidaceae, and Iridaceae as far as such relationships are shown by the anatomy of the peduncle and flower.—*J. C. Gilman*.

2007. GRAVIS, A. Connexions anatomiques de la tige et de la racine. [Anatomical connections between stem and root.] Bull. Acad. Roy. Belgique, Cl. Sci. 1919⁴: 227-236. 1919.—There is no true transition between these organs. The union of the conducting strands in the 2 regions is brought about (in young plants) by means of special cell groups (triads) composed of 1 group of centripetal vessels situated between the 2 halves of a fibro-vascular bundle consisting of centrifugal wood. At a level above this point, the 2 halves unite and the centripetal vessels disappear. At a lower level it is the centrifugal wood which disappears, and the bast bundles alternate with the centripetal wood strands. The author has studied various types of triads, and suggests solutions for the problems of the circulation of water in the young plant, the morphological value of the single cotyledon of monocotyledons and the evolutionary origin of these plants, the character of the so-called pseudo-monocotyledonous plants, the origin of the structure of stem and root from the point of view of phylogeny, and the significance of the triads.—*Henri Micheels*.

2008. HAAN, H. R. N. DE. Contribution to the knowledge of the morphological value and the phylogeny of the ovule and its integuments. Recueil Trav. Bot. Néerland. 17: 219-322. Fig. 1-12. 1920.—The structure of the ovule and in particular of its integuments is described in detail for the fossils *Lepidocarpon*, *Miadesmia membranacea*, *Lagenostoma Lomaxii*, *Sphaerostoma ovale*, *Physostoma elegans*, *Trigonocarpus Parkinsoni*, *Mitrospermum compressum*, and *Bennettites*; and (in living plants) for 7 genera of cycads, for *Ginkgo*, for 8 genera of conifers, and for 3 of Gnetales. Ovular characters are critically compared throughout this wide range of plants in an attempt to determine the evolutionary history of the ovule and in particular of the integumentary structures. The author suggests that the most primitive type appears in *Physostoma*, where the units constituting the integument are most clearly evident. Progressing upward in the plant series these units become less and less clearly recognizable. The double integument, which makes its first appearance in the Gnetales and which occurs in the angiosperms, is discussed, and several suggestions to account for its origin are brought forward. The author concludes that the integuments of pteridosperms, gymnosperms, and (probably) angiosperms are homologous structures. The integument of these forms bears no relation to the indusium of ferns.—*J. C. Th. Uphof*.

2009. HALL, HARVEY MONROE, AND THOMAS HARPER GOODSPEED. A rubber plant survey of northwestern North America. Univ. California Publ. Bot. 7: 159-278. Pl. 18-30. 8 fig. 1919.—See Bot. Absts. 8, Entries 2010, 2011, 2248.

2010. HALL, HARVEY MONROE, AND THOMAS HARPER GOODSPEED. Chrysil, a new rubber from *Chrysothamnus nauseosus*. [Part II of: HALL, H. M., AND T. H. GOODSPEED. A rubber plant survey of northwestern North America.] Univ. California Publ. Bot. 7: 183-264. Pl. 18-20, 6 fig. 1919.—The present paper undertakes to deal with "Chrysil," the rubber prepared

from any form of *Chrysothamnus nauseosus*: Its nature and properties; the distribution and habitats of the various forms of the plant producing it; the amounts of Chrysil available in western North America as estimated by districts; microscopical methods and chemical analysis as methods for detecting the presence of rubber and determining its amount; the results of the application of these methods in each variety of the species; distribution of rubber in the plant; factors influencing rubber content; methods of harvesting; possibilities of *C. nauseosus* as a cultivated plant and its cultural requirements. Primarily this is a study of the anatomy and histology of the varieties of the species mentioned in its various districts, with certain reference to the possibilities of Chrysil being utilized, especially in times of rubber scarcity.—W. A. Setchell.

2011. HALL, HARVEY MONROE, AND THOMAS HARPER GOODSPEED. The occurrence of rubber in certain West American shrubs. [Part III of: HALL H. M., AND T. H. GOODSPEED. A rubber plant survey of northwestern North America.] Univ. California Publ. Bot. 7: 265-278. 2 fig. 1919.—The present paper deals with the following: I, *Chrysothamnus* (exclusive of *C. nauseosus*) and *Haplopappus*; II, regional distribution of rubber in *Haplopappus*; III, species in which no rubber is found.—W. A. Setchell.

2012. HARRIS, J. ARTHUR, EDMUND W. SINNOTT, JOHN Y. PENNYPACKER, AND G. B. DURHAM. The vascular anatomy of dimerous and trimerous seedlings of *Phaseolus vulgaris*. Amer. Jour. Bot. 8: 63-102. 23 fig. 1921.—The gross vascular anatomy of normal ("dimerous") bean seedlings and of abnormal "trimerous" forms (with 3 cotyledons and 3 primordial leaves) were studied descriptively and biometrically. In the typical condition of the normal seedling the root is tetrarch, there are 8 bundles in the hypocotyl, 2 strands depart for each cotyledon and the remaining bundles produce 12 strands in the epicotyl. In the typical trimerous seedling the root is hexarch, there are 12 bundles in the hypocotyl, 2 strands depart to each cotyledon and there are from 14 to 18 strands in the epicotyl. Additional, or "intercalary," bundles appear in the hypocotyl of both types, but more often in normal seedlings. Bundle number in both types showed considerable variation, and the degree of variability differed with the seedling type and the region of the plant. Biometrical constants for the mean, standard deviation, and coefficient of variability for bundle number were determined for the various types of bundles and for the different regions of both seedling types. The variability in number of root poles is higher in trimerous than in dimerous seedlings. Intercalary bundles are highly variable in both types. In the hypocotyl, bundle number is far more variable in dimerous than in trimerous seedlings, but in the epicotyl just the reverse is true. Explanations of these differences are offered, based on a study of the general and comparative morphology of the plants in question. The authors emphasize "the importance of the use of both biometric and comparative methods to supplement each other in any attack upon the problems of general morphology or of morphogenesis."—E. W. Sinnott.

2013. KONDO, M. Ueber die in der Landwirtschaft Japans gebrauchten Samen. [Seeds used in Japanese agriculture.] Ber. Ohara Inst. Landw. Forsch. 1: 399-450. 16 fig. 1919.—A continuation of descriptions already published (see Bot. Absts. 5, Entry 37) dealing with certain morphological characters of seeds and seedlings.—The present article describes seeds of the following plants: *Allium fistulosum*, *A. odorum*, *A. cepa*, *A. porrum*, *Daucus Carota*, *Cryptotaenia canadensis* var. *japonica*, *Apium graveolens*, *Petroselinum sativum*, *Arctium lappa*, *Lactuca sativa*, *Chrysanthemum coronarium*, *C. cinerariifolium*, and *C. roseum*.—H. S. Reed.

2014. MARLOTH, R. Notes on the function of the staminal and staminodal glands in the flowers of *Adenandra*. Ann. Bolus Herb. 3: 38-39. Pl. 1., fig. A. 1920.—The flower possesses 5 perfect stamens and, alternating with them, 5 sterile staminodes. Each of these organs bears a gland at its apex which secretes a viscid fluid. The secretion is a kind of balsam. The flowers are strongly protandrous. When the bud opens the staminodes connive toward the center of the flower, their glands being viscid; the stamens, on the other hand, stand erect outside the staminodes, the anthers being still closed and the apical glands erect and dry.

The viscid fluid can apparently serve only one purpose, to act as an adhesive by means of which the pollen is firmly attached to the mouth parts of the visiting insects as they force their heads in between the stamens and staminodes to reach the honey in the base of the flower. The complicated movements during anthesis are evidently the means of securing cross pollination.—*E. P. Phillips.*

2015. VUILLEMIN, PAUL. *L'inflorescence de Fuchsia coccinea*. [The inflorescence of *Fuchsia coccinea*.] *Compt. Rend. Acad. Sci. Paris* 171: 1194–1196. *Fig. 1–15*. 1920.—A teretological study of variations in symmetry, fusion of parts, and number of parts of the flowers of this species.—*C. H. Farr.*

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

2016. DIXON, ANNIE. Exhibition of fresh-water Protozoa, June 5th. *Ann. Rept. and Trans. Manchester Microsc. Soc.* 1919: 61, 62. 1920.—A list and discussion of forms exhibited at the June, 1919, meeting of the Manchester Microscopical Society. Among the forms noted are *Volvox globator*, *Pandorina morum*, *Phacus triqueter*, and 2 species of *Euglena*.—*C. E. Allen.*

2017. DIXON, ANNIE. Protozoa. Report on gatherings from a pond at Lawnhurst, Didsbury, from 14th March to 12th Sept., 1918. *Ann. Rept. and Trans. Manchester Microsc. Soc.* 1919: 74–81. 1920.—Flagellata and Dinoflagellata are included among the species listed.—*C. E. Allen.*

2018. DIXON, ANNIE, W. LEACH, H. BENDORF, AND J. G. KITCHEN. Ramble to Poundswick and Northenden, May 24th, 1919. *Ann. Rept. and Trans. Manchester Microsc. Soc.* 1919: 62, 63. 1920.—The list of species observed includes Myxophyceae, Chlorophyceae, Bacillariaceae, Bryophyta, and (under Protozoa) several Flagellata and Dinoflagellata.—*C. E. Allen.*

2019. LEACH, W. Ramble round Northenden, July 26th, 1919. *Ann. Rept. and Trans. Manchester Microsc. Soc.* 1919: 63. 1920.—Several Flagellata and Dinoflagellata are included in the list of Protozoa observed.—*C. E. Allen.*

2020. LUCAS, R. Protozoa. *Arch. Naturgesch.* 80 B: 221–420. 1914 [1920].—A report of the literature which appeared during 1913 dealing with the Protozoa, including flagellates and dinoflagellates. A list of works arranged alphabetically under authors' names is followed by a résumé according to subject, and finally by a taxonomic summary.—*C. E. Allen.*

2021. MARUKAWA, H. Plankton list and some new species of Copepoda from the northern waters of Japan. *Bull. Inst. Oceanograph. Monaco* 384. 15 p., pl. 1–4 and map. 1921.—A list of 87 phytoplankton species collected in 1915–1916 in the Japan and Okhotsk seas and in the northern Pacific Ocean. The name, date, locality, and local distribution are given, in tabular form.—*T. C. Frye.*

2022. OKAMURA, KINTARO, KEISUKE ONDA, AND MICHITARO HIGASHI. Preliminary notes on the development of the carpospores of *Porphyra tenera* Kjellm. *Bot. Mag. Tôkyô* 34: 131–135. Pl. 3. 1920.—Carpospores were grown both in normal sea water and in the same diluted and enriched with calcium phosphate and NaNO_3 up to a specific gravity of 1.020. In both cases the carpospores put out rhizoidal outgrowths, shorter in the enriched solution, which produced frond-like growths, in no instance did the authors observe the development of gametes in the manner reported by YENDO (see Bot. Absts. 3, Entry 2464). They suggest possibility that the hypothetical gametes may have belonged to a Chytridinean fungus parasite.—*Leonas L. Burlingame.*

2023. SIMONS, HELLMUTH. Eine saprophytische Oscillarie im Darm des Meerschwein-chens. [A saprophytic Oscillatoria in the intestine of the guinea pig.] Centralbl. Bakt. II. Abt. 50: 356-367. 1920.—The author, while searching for *Trichomonas* in the caecum of guinea pigs, accidentally discovered an alga which after careful study was found to be an *Oscillaria*. Botanically the important point of interest is the nutrition of this alga which, living in total darkness, has become colorless and can no longer assimilate CO₂. It is probable that nutrition takes place purely through diffusion of organic materials in solution. The author, a zoologist, calls on the botanists for further investigations.—Anthony Berg.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 1686, 1688, 1721, 1788, 2018, 2199, 2230, 2259)

2024. BRITTON, NATHANIEL LORD. *Flora of Bermuda* (illustrated). 8vo., 586 p., 1 pl., 519 fig. Charles Scribner's Sons: New York, 1918.—See Bot. Absts. 8, Entry 687.

2025. BRITTON, N. L., AND C. F. MILLSPAUGH. *The Bahama Flora*. Roy. 8 vo., viii + 695p. Published by the authors: New York, 1920.—See Bot. Absts. 7, Entry 1429.

2026. BURNHAM, STEWART H. *The mosses of the Lake George Flora*. Bryologist 23: 17-26. 1920.—See Bot. Absts. 8, Entry 118.

2027. CASARES-GIL, A. *Flora Iberica. Briófitas, primera parte. Hepáticas*. [Flora of Iberia. Bryophytes, first part. Hepaticae.] 8 vo., 775 p., 4 pl., 399 fig. Mus. Nacion. Cien. Nat. Madrid, 1919.—Aside from lists and short treatments in general descriptive works there has hitherto been no publication of much value to the student of the hepatics of Spain and Portugal. The present work fully supplies this need. The general introduction is followed by a detailed discussion of numerous morphological topics and by an account of the ecology and geographical distribution of the Hepaticae, in which emphasis is laid on their relation to substratum, humidity, latitude, and temperature. In the taxonomic portion of the volume, which occupies nearly 600 pages, 329 species are described and figured or at least critically discussed, many of these species being still unknown on the Iberian Peninsula. The book in fact is a manual of the hepatics of all southwestern Europe. In classification and nomenclature SCHIFFNER's treatment in the Engler and Prantl Pflanzenfamilien is usually followed, but the author has found it advisable to propose the following new specific combinations: *Calycularia Flotowiana* (Nees), *Haplozia Muellieriana* (Schiffn.), *Haplozia parvica* (Schiffn.), and *Haplozia subelliptica* (Lindb.).—O. E. Jennings.

2028. DIXON, H. N. *New and interesting South African mosses*. Trans. Roy. Soc. South Africa 8: 179-224. Pl. 11, 12. 1920.—A long series of South African mosses is enumerated, most of which were collected by H. A. WAGER, T. R. SIM, J. HENDERSON, D. B. HENDERSON, or M. HENDERSON. Each species is accompanied by full data regarding localities and, in many cases, by critical notes. In several instances the identity of South African species with those occurring in north temperate regions is established, and keys to the South African species are given under *Bryum* and *Lindbergia*. The following new species are described and figured, Dixon being the authority except where otherwise noted: *Brachythecium afro-albicans*, *B. pinnatum*, *Bryum pumili-roseum*, *Dicranella Symonsii*, *Didymodon afro-rubellus* Broth. & Wager, *D. Pottsii*, *Ditrichum spirale*, *Entodon cymbifolius* Wager & Dixon, *Erpodium distichum* Wager & Dixon, *E. transvaaliense* Broth. & Wager, *Fissidens papillifolius*, *Glypomitrium marginatum* Wager & Dixon, *Gymnostomum Bewsii* Sim, *Isopterygium brachycarpum*, *Lindbergia viridis*, *Microthamnium ctenidioides*, *Plagiothecium Hendersonii*, *Psilopilum afro-laevigatum*, *Ps. Wageri* Broth., *Sciaromium capense*, *Tortula trachyneura*, and *Zygodon Simii*. The following new specific combinations are likewise made: *Anomobryum promontorii* (C. M.), *Brachymenium campylotrichum* (C. M.), and *Gymnostomum gracile* (Wager).—E. M. Doidge.

2029. DUTTON, D. LEWIS. *Buxbaumia indusiata* Brid., from Brandon, Vermont. *Bryologist* 24: 8. 1921.

2030. ELLEN, SISTER M. The germination of the spores of *Conocephalum conicum*. *Amer. Jour. Bot.* 7: 458-464. *Pl.* 34, 35. 1920.—In this species spores are well developed before September first (in Wisconsin) and during the fall cell divisions take place within them, 6 or 8 cells being produced within the spore wall. Winter is passed in this stage. In the spring, cell divisions proceed rapidly until each sporeling develops into a nearly spherical mass of from 30 to 40 cells, provided with chlorophyll and starch. The stalks of the carpocephala now lengthen rapidly; the setae elongate, thrusting the capsules through the calyptra; the capsule walls rupture, and the sporelings are dispersed. Sporelings collected in the fall and sown will develop. By bringing the plants or sporelings indoors and thus subjecting them to artificial conditions the normal developmental stages may be altered somewhat.—*E. W. Sinnott.*

2031. FAMILLER, I. Einige kritische Bemerkungen zu J. Röhl. Die Thüringer Torfmoose und Laubmoose und ihre geographische Verbreitung. [Critical remarks on J. Röhl's Thuringian mosses and their geographical distribution.] *Krypt. Forsch. Bayerische Bot. Ges.* 3: 187-188. 1918.—See *Bot. Absts.* 8, Entry 123.

2032. FLEISCHER, M. [Rev. of: AMANN, J., ET C. MEYLAN. *Flore des mousses de la Suisse*. (Moss flora of Switzerland.) Geneva, 1918 (see *Bot. Absts.* 4, Entry 1032).] *Hedwigia* 61: (Beiblatt) 34, 35. 1919.—The reviewer criticizes the non-use of Latin in describing new species and enumerates several generic names which he considers untenable. He likewise thinks that the authors should have adhered less to the old Schimperian classification and have made use of the more natural classification given in *Die Natürlichen Pflanzenfamilien* of Engler and Prantl.—*A. W. Evans.*

2033. FRYE, T. C. Notes on useful and harmful mosses. *Bryologist* 23: 71. 1920.—See *Bot. Absts.* 7, Entry 1513.

2034. GAGER, C. STUART. Heredity and evolution in plants. *xv + 265 p., 112 fig.* P. Blakiston's Son & Co.: Philadelphia, 1920.—See *Bot. Absts.* 7, Entry 1610.

2035. HOLZINGER, J. M. [Rev. of: DIXON, H. N. *New and interesting South African mosses*. *Trans. Roy. Soc. South Africa* 8: 179-224. *Pl.* 11, 12. 1920 (see *Bot. Absts.* 8, Entry 2028).] *Bryologist* 23: 91-92. 1920.—The reviewer commends the author's careful tracing of the identity of African species with those of temperate regions.—*E. B. Chamberlain.*

2036. JÄGGLI, MARIO. Contributo alla briologia ticinese. [Contribution to the bryology of Ticino.] *Boll. Soc. Ticinese Sci. Nat.* 1919: 27-44. 1919.—The author gives a list of 181 mosses from the canton of Ticino, Switzerland, based on collections which he made in 1902 and later. Full data regarding stations are given under each species, and critical notes are occasionally added. Of the species listed *Fissidens Curnowii* Mitt. and *Cylindrothecium cladorrhizans* (Hedw.) Schimp. are new to Switzerland, and 16 other species or varieties are new to Ticino.—*A. W. Evans.*

2037. JÄGGLI, MARIO. Una nota inedita di Alberto Franzoni sulle epatiche ticinesi. [An unpublished note by Alberto Franzoni on the hepaticae of Ticino.] *Boll. Soc. Ticinese Sci. Nat.* 1919: 19-26. 1919.—The author publishes a list of the Hepaticae known from the canton of Ticino, Switzerland. This list is based largely on a manuscript of FRANZONI bearing the date 1869, and for most of the records there are actual specimens in the Franzoni herbarium, now preserved in the museum at Locarno. The species enumerated number 64, of which 48 are Jungermanniales and 16 Marchantiales. From a historical standpoint the most interesting species listed is *Scapania Franzoniana* DeNot., here reduced to synonymy by MEYLAN and included under *S. subalpina* var. *purpurascens* Bryhn.—*A. W. Evans.*

2038. KAALAAS, B. Einige Bryophyten aus dem südlichsten Siberien und dem Urjankai-lande. [Bryophytes from the southernmost part of Siberia and the Urjankai country.] Skrifter K. Norske Videnskab. Selskab [Trondhjem] 1918: 1-13. Pl. 1, 2, 2 fig. 1919.—The collection studied by the author was made in 1914 by H. PRINTZ, botanist of the Norwegian Scientific Expedition to southern Siberia and the Urjankai country. It consists of fragmentary specimens growing in tufts of *Carex* or on the soil adherent to the roots of other vascular plants. The species listed include 8 hepatics, 7 peat mosses, and 57 true mosses. Two of the latter, *Brachythecium abakanense* and *Rhytidiadelphus Printzii*, are described as new and illustrated on the 2 plates, which were drawn by Printz.—A. W. Evans.

2039. KASHYAP, S. R. Distribution of liverworts in the western Himalayas. Jour. Indian Bot. 1: 149-157. 1920.—See Bot. Absts. 8, Entry 130.

2040. LORENZ, ANNIE. Some hepaticae from Matinicus Island, Maine. Bryologist 23: 1-3. 1920.—See Bot. Absts. 8, Entry 133.

2041. LOWE, RACHEL L. *Rhacomitrium sudeticum*, a moss new to Worcester County, Massachusetts. Bryologist 23: 4-5. 1920.—See Bot. Absts. 8, Entry 134.

2042. NEGRI, G. Su un musco cavernicolo crescente nell' oscurità assoluta. [A moss growing in absolute darkness.] Atti R. Accad. Lincei Roma Rendiconti Cl. Sci. Fis. Mat. e Nat. V, 29: 159-162. 1920.—See Bot. Absts. 7, Entry 2170.

2043. STANDLEY, PAUL C. *Sphagnum* in Glacier National Park, Montana. Bryologist 23: 5-6. 1920.—See Bot. Absts. 8, Entry 142.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

(See also in this issue Entries 1827, 1837, 2194, and entries in the section Pathology)

FUNGI

2044. ANONYMOUS. [Rev. of: GUILLIERMOND, A. The yeasts. Translated and revised by F. W. TANNER. xix + 424 p., 163 fig. Chapman & Hall, Ltd.: London, 1920 (see Bot. Absts. 8, Entry 2057).] Sci. Prog. [London] 15: 500. 1921.

2045. ARTHUR, JOSEPH CHARLES. *Aecidiaceae* (Uredinales). North Amer. Flora 7: 269-336. Dec. 24, 1920; 7: 337-404. Dec. 31, 1920; 7: 405-480. Feb. 8, 1921.—In continuation of his taxonomic treatment of the North American rusts the author in Part 4 presents a key to the 269 recognized American species of *Dicæoma* and gives a complete treatment of 88 species. For each of these is given complete synonymy, descriptions of the several stages and the known host plants on which each occurs. Exsiccatae are cited, and the distribution and the type locality for each species is given together with the published illustrations. For those species that occur on Poaceae FRED DENTON FROMME is named as collaborator. A total of 44 new species or new combinations is given. The latter in most cases represent transfers from *Puccinia*, *Aecidium*, *Uredo*, and *Roestelia*. Two transfers are made from *Diorchidium* and one from *Uromyces*.—In Part 5 the treatment of *Dicæoma* is continued with the presentation of descriptions of 112 species. For species on *Carex* the author has collaborated with FRANK DUNN KERN. A total of 63 new species or new combinations is given, the latter representing transfers chiefly from *Puccinia*, *Aecidium*, *Uredo*, and *Cæoma*. One transfer is made from *Rostrupia*.—In Part 6 *Dicæoma* is completed and HERBERT SPENCER JACKSON is named as collaborator for the species which occur on *Carduaceae*. In this part is given a similar treatment of the genus *Pucciniola* with 25 species and *Allodus*

with 49 species. In the latter genus CLAYTON ROBERTS ORTON is named as collaborator for all the species. The genus *Klebahnia* having 8 species is begun but only 6 of them are completely treated. Of new species and new combinations there are in this part 51 for *Dicaeoma*, 25 for *Pucciniola*, 10 for *Allodus*, and 5 for *Klebahnia*. The new combinations in *Dicaeoma* represent transfers from *Puccinia*, *Uredo*, and *Aecidium*, those in *Pucciniola* transfers from *Aecidium*, *Uromyces* and *Puccinia*, those in *Allodus* transfers from *Puccinia* and *Aecidium*, and those in *Klebahnia* transfers from *Uromyces*.—The material here presented is the first thorough taxonomic work on these groups in North America and it should be examined by every student interested in the rusts.—*E. B. Payson*.

2046. ARTHUR, JOSEPH CHARLES. New species of Uredineae-XIII. Bull. Torrey Bot. Club 48: 31-42. 1921.—*Puccinia pacifica* Blasdale, *P. irrequisita* Jackson, *Uromyces coordinatus*, *Ravenelia havanensis*, and *Lipospora tucsonensis* are described as new species. *Puccinia additica* Jackson & Holway nom. nov. for *P. Coreopsidis* Jackson & Holway, *P. opposita* (Orton) comb. nov., *P. Erigeniae* (Orton) comb. nov., *Polythelis suffusa* (Holway) comb. nov., and *Gallowaya pinicola* nom. nov. for *G. Pini* Arth. are given and the following new genera are made: *Lipospora* and *Teleutospora* Arthur & Bisby, the latter being for 3 species of *Uromyces* (*U. Rudbeckiae* Orth. & Holw., *U. Solidaginis* Niessel, and *U. bauhinicola* Arth.). *Micropuccinia* Rostrup is discussed and to it are referred a number of species included by Rostrup in 1902 as well as those short-cycle forms placed by him in *Dasyscypha*. Ninety species are here referred to *Micropuccinia*, and are to be credited to Arthur and Jackson.—*P. A. Munz*.

2047. BACHMANN, E. Der Thallus saxikoler Pilze: *Phaeospora propria* (Arn.) und *Nectria indigens* (Arn.). [The thallus of the saxicolous fungi *Phaeospora propria* (Arn.) and *Nectria indigens* (Arn.).] Centralbl. Bakt. II Abt. 50: 45-54. Fig. 1-11. 1920.—By the term saxicolous fungi, the author designates fungi which grow and fruit on rock apparently free from organic matter. The author has previously shown in the case of *Pharcidium lichenum* (Arn.) and *Didymolla Lettaniana* Keiszl. that such fungi exist. The present investigations show that *Phaeospora propria* (Arn.) is an endolithic lime fungus with a parasymbiotic mode of life. It probably lives with vigorously developed and fruiting lichen beds as a parasymbiont. Most significant, however, is the fact that the fungus has the power of penetrating deeply into the lime not only by means of the lichen hyphae but also by means of true fungus hyphae. If the dissolving of the lime is accomplished by means of CO₂ produced in the respiration of the fungus, it would appear that there are 2 types of saxicolous fungi, one with an accentuated respiration (endolithic) and the other with normal respiration (exolithic). *Nectria indigens* is an exolithic lime fungus which grows parasymbiotically with several lichen complexes but in no way forms a truly combined lichen thallus. In its latest stages, however, the fungus lives as a true parasite upon the engulfed lichen complex. The lichen seems to be the only visible source of carbon for this saxicolous fungus.—*Anthony Berg*.

2048. BAMBEKE, CHAS. VAN. Recherches sur certains elements du mycélium d'*Ithyphallus impudicus* (L.). [Certain elements of the mycelium of *I. impudicus*.] Bull. Acad. Roy. Belgique Cl. Sci. 1914: 280-286. 2 pl. 1914 [1919].—The author concerns himself here with structures which from their shape and certain peculiarities he calls "glomézules mycéliens." They occur in the cortex of the rhizomorphs. After describing their form and structure the author states that they do not constitute organs of propagation comparable to the bulbils and tubercles of the phanerogams.—*Henri Micheels*.

2049. BOEDYN, K., UND C. VAN OVEREEM. Mycologische Mitteilungen. Serie I. Ascomyceten. Erstes Stück. Über das Vorkommen von Carotinkristallen in zwei neuen Pezizaarten. [Mycological notes. Series I. Ascomycetes. First part. On the occurrence of carotin crystals in two new species of Peziza.] Hedwigia 59 307-312. Pl. 2. 1918.—Two species of the Pezizales are described as new, *Humaria carota* and *Ascophanus fimicola*. Carotin in the form of prominent crystals was found in the ends of the paraphyses and in the cells of the hypothecium.—*H. M. Fitzpatrick*.

2050. BOSE, S. R. Descriptions of fungi in Bengal, Series II, in continuation of Proc. Indian Assoc. Cultivation Sci. Vol. IV Part IV (Agaricaceae and Polyporaceae). Proc. Sci. Convention Indian Assoc. Cultivation Sci. 1918: 136-143. Pl. 1-13. 1920.—The following species collected in Calcutta and its suburbs are described and figured (the figures show the fruiting body above, below, and in section): *Lepiota mastoidens*, *Coprinus niveus*, *Volvaria tirastins*, *Lenzites betulina*, *Polyporus gilvus*, *P. sp.*, *Polystictus versicolor*, *P. leoninus*, *P. tabacinus*, *Fomes annularis*, *F. (Ganoderma) lucidus*, *Trametes cingulatus*, *Daedalea Hobsoni*. Most of the polypores reported were found on dead wood. The paper constitutes part II of Bengal Polyporaceae, which is being published serially.—S. R. Bose.

2051. COSTANTIN, JULIEN, ET LEÓN DUFOR. Sur la biologie du *Goodyera repens*. [Concerning the biology of *Goodyera repens*.] Rev. Gén. Bot. 32: 529-533. 1920.—A fungus isolated in a large proportion of the trials is regarded as a symbiont and is named *Rhizoctonia Goodyera repentis*.—J. C. Gilman.

2052. DIETEL, P. Über die Aecidiumform von *Uromyces Genistae tinctoriae*. [Concerning the aecial state of *Uromyces Genistae tinctoriae*.] Ann. Mycol. 17: 103-109. 1919 [1920].—Observations made by the author on a field association of an Aecidium on *Euphorbia cyparissias* with *Uromyces Genistae tinctoriae* (Pers.) Wint. on *Genista tinctoria* are recorded. These observations strongly indicated a genetic connection between the two forms and an isolated field culture was accordingly made which resulted in the development of uredinia on *Genista tinctoria* following exposure to infection by aeciospores from *Euphorbia cyparissias*. The aecial state belongs to the collective species *Aecidium Euphorbiae* Gmel. which causes deformation of the host. Considerable variation exists in the character of the deformation in this species and the author describes this in some detail in comparison with a description of the case observed. There appears to be no correlation between the type of deformation in the aecial host and the different species of *Uromyces* with which this aecidium has been previously connected.—H. S. Jackson.

2053. DOIDGE, ETHEL M. South African Microthyriaceae. Trans. Roy. Soc. South Africa 8: 235-282. Pl. 13-19. 1920.—This is a systematic account of the South African Microthyriaceae as represented in the Union National Herbarium. Fifty species are included belonging to the following genera: *Microthyrium* (1), *Seynesia* (1), *Morenoina* (1), *Englerulaster* (3), *Parasterina* (3), *Asterina* (30), *Asterinella* (4), *Lembosia* (3), *Echidnodes* (1), *Morenoella* (1), *Echidnodella* (1), *Amazonia* (1). Theissen records only 6 species of *Asterina* from Africa. The following new species are described: *A. clausenicola*, *A. delicata*, *A. Excoecariae*, *A. ferruginosa*, *A. Hendersoni*, *A. natalensis*, *A. Peglerae*, *A. polythyria*, *A. raripoda*, *A. reticulata*, *A. rhamnicola*, *A. robusta*, *A. Trichiliae*, *A. uncinata*, *A. undulata*, *Parasterina implicata*, *P. rigida*, *Asterinella Acokantherae*, *A. Burchelliae*, *A. lembosioides*, *A. Woodiana*, *Englerulaster Popowiae*, *Lembosia natalensis*, *L. radiata*, *Echidnodes rhoina*, *Microthyrium maculicolum*, *Echidnodella Hypolepides*, *Morenoella Oxyanthae*, *Morenoina africana*. A host index is appended.—E. M. Doidge.

2054. ERIKSSON, JAKOB. Die Hauptergebnisse einer Untersuchung über den Wirtswechsel und die Spezialisierung von *Puccinia Caricis* Reb. [Principal results of investigations regarding the alternation of hosts and the specialization of *Puccinia Caricis* Reb.] Centralbl. Bakt. II Abt. 50: 441-443. 1920.—A preliminary report of culture studies with *Puccinia Caricis* giving an analytical grouping of the results based on the experiments of the author and those of H. KLEBAHN. Numerous observations point to the conclusion that there are biological forms in all groups studied.—Anthony Berg.

2055. FOËX, E. Sur l'histoire du développement du *Peronospora spinaciae* (Grew.) Laub. [Rev. of: ERIKSSON, J. On the development of *Peronospora spinaciae* (Grew.) Laub. Ark. Bot. 15¹⁵: 1-25. Pl. 4, 3 fig. 1918 (see Bot. Absts. 3, Entry 356).] Rev. Gén. Bot. 32: 552-560. Pl. 14, 15. 1920.—A technical review of Eriksson's work describing the life-cycle of the fungus, including mycoplasm phase, oospores, and oospore germination.—J. C. Gilman.

2056. FRIEDERICH, K. Über die Pleophagie des Insektenpilzes *Metarrhizium anisopliae* (Metsch.) Sor. [On the parasitism of the insectivorous fungus *Metarrhizium anisopliae* (Metsch.) Sor.] Centralbl. Bakt. II Abt. 50: 335-356. Pl. 1 (colored). 1920.—The fungus growth is pictured in colors. The results of a number of experiments in which various hosts were used are recorded. An extensive bibliography is appended.—H. M. Fitzpatrick.

2057. GUILLIERMOND, ALEXANDRE. The yeasts. Translated and revised in collaboration with the original author by F. W. TANNER. xix + 424 p., 163 fig. John Wiley and Sons, Inc.: New York; Chapman and Hall, Ltd.: London, 1920.—This English edition is based on Guilliermond's "Les Levures," published in 1912 as a volume of the Encyclopédie Scientifique. It is not merely a translation, but constitutes a revision in the light of recent literature. The yeasts are treated from the standpoints of morphology, cytology, physiology, phylogeny, and taxonomy. Methods for use in the characterization and identification of species are given, as well as methods of culture and isolation. In the taxonomic treatment the group is subdivided into Saccharomycetes and Non-Saccharomycetes, the latter group embracing such genera as *Torula*, *Pseudosaccharomyces*, *Cryptococcus*, and *Mycoderma*. Fungi related to the yeasts are also discussed, e. g., *Endomyces albicans*, *Monilia candida*, *Pseudomeliola albomarginata*, and *Parendomyces pulmonalis*. Many of the forms are figured. An extensive bibliography is appended. A large number of pathogenic yeasts are described. An attempt has been made to present in a single book the essential information available concerning the whole group of yeasts and yeast-like organisms having in mind every point of view. Although several treatises have previously appeared dealing with yeasts in relation to fermentation this is the first book to cover the broader field, and it fills a need long felt for a comprehensive reference work on this subject.—H. M. Fitzpatrick.

2058. HENRICI, A. T., AND E. L. GARDNER. The acid fast actinomycetes with a report of a case from which a new species was isolated. Jour. Infect. Diseases 28: 232-248. 1921.—A new species of *Actinomyces*, *A. gypsoides*, which is acid fast and pathogenic is described. It is characterized by strong proteolytic activities, the darkening of media containing peptone, and the possession of chalky-white aerial mycelium.—Selman A. Waksman.

2059. HERRMANN, EMIL. Bestimmungstabelle zu den Täublingen. [Key to the Russulas.] Hedwigia 60: 331-341. 1919.—A key to the species of the genus *Russula* based primarily on color and taste. Almost 100 species are included.—H. M. Fitzpatrick.

2060. HIGGINS, B. B. Morphology and life history of some ascomycetes with special reference to the presence and function of spermatia. Amer. Jour. Bot. 7: 435-444. 2 fig., 1 pl. 1920.—Spermatia or similar structures have been observed in various families of ascomycetes. As an example of a species which produces spermatia, the author outlines the life history of *Mycosphaerella Bolleana* n. sp., an ascomycete parasitic on the leaves of the fig. He presents a diagnosis of the species and describes in detail the production of conidia, spermatia, and asci. All attempts to germinate the spermatia failed. Artificial infections with ascospores produced conidia on the leaves of the fig.—E. W. Sinnott.

2061. HÖHNEL, FRANZ VON. Mycologische Fragmente. [Mycological fragments.] Ann. Mycol. 17: 114-133. 1919 [1920].—*Tricholoma tenuiceps* Cooke & Massee is transferred to *Russula*. *Mycopron Pandani*, on dry leaves of *Pandanus* sp., and *Phragmothryrium fimbriatum*, on leaves of *Ardisia fuliginosa*, are described as new; the latter is compared with *P. corruscans* (Rehm) Th. *Meliola rubicola* P. Henn. is considered identical with *Sphaeria calostroma* Desm. The structure of the perithecial wall and appendages is described and the relationship of this genus, as illustrated by this species, with other groups is discussed. *Asterella olivacea* v. H. is transferred to *Microthyriella* v. H. and the relationship of the latter genus with *Schizothyrium* discussed. *Pseudonectria Metzgeriae* Ade. & v. H., found on upper surface of thallus of *Metzgeria furcata*, is described as new. *Sphaeria bryophila* Roberge is thought to be identical with *S. muscivora* Berk. & Br. and the new combination *Nectria muscivora* (Berk.

& Br.) v. H. is proposed; a full description is furnished. The author concludes from an examination of original material that *N. Hippocastani* Otth. (*Calonectria Hippocastani* (Otth.) Sacc.) is based on a mixture of *Nitschkia cupularis* (Pers.) Kant. and *Melanomma Pulvis pyrius* (Pers.) Fekl. After a study of original material the author also concludes that *Miyakeamyces Bambusae* Hara, originally described as a new genus and species, is not parasitic on *Phyllachora Phyllostachydis* Hara, but is parasitic directly on the leaves of *Phyllostachys bambusoides*; it is here considered one of the Nectriaceae and transferred to the genus *Calonectria*. A full redescription is given. *Broomella Lagerheimia* Patouill. is considered a related species and is also transferred to *Calonectria*. For the benefit of those who accept the genus *Puttemansia* P. Henn. as distinct from *Calonectria*, new combinations of these 2 species are also provided in that genus. *Neopeckia episphaeria* occurring on old stomata of *Hypoxylon rubiginosum* is described as new. A new genus of the Melanommeae, **Melanopsammella**, based on *Eriosphaeria inaequalis* Grove, is proposed with *Gonythyricum* as the conidial stage. *Sphaeria helicicola* Desm. is redescribed from original material and transferred to *Lophiotrema*. The opinion is expressed that *Sphaeria Hederae* Sow. is probably identical with *S. helicicola*. *Othia Winteri* Rehm is thought to be only a poorly developed form of *Cucurbitaria protracta* Fekl. *Othia Rubi* occurring on canes of *Rubus Idaeus* and *R. caesius* is described as a new species based on specimens distributed in Roumeguere's Fungi Gall. Exc. Nos. 1585 and 1596 as *Melanopsamma mendax* S. & R. and *M. ruborum* (Lib.) respectively. *Uleomyces cinnabarinus*, parasitic on the stroma of *Venturia aggregata* Wint., is described as a new species. The latter is redescribed and transferred to *Antennularia* (*Caleroa*). The opinion is expressed that *Antennularia*, *Montagnina*, and *Parodiella* are related genera and best placed in the Cucurbitariaceae. *Botryostroma inaequale* (W.) v. H. is considered to be dothidiaceous and related to *Munkiodothis*. A description of *Didymella superflua* (Awld.) Sacc. drawn from authentic material is given, together with a historical review of the species and a discussion of its relationships and associated forms; a considerable number of specimens, including many issued in various exsiccati, were examined and a detailed discussion of these is included. *Epicoccum nigro-cinnabarinum* is described as new, based on Sydow's Mycoth. March No. 2548. The new combination *Didymella Sisymbrii* (Rehm) v. H., based on *D. superflua* var. *Sisymbrii* Rehm, is proposed and a description furnished drawn from specimens issued in Krieger F. Saxon. No. 2314 and Rehm Ascom. Exs. No. 2170. Attention is called to the necessity for a critical study of all species of the genus *Didymella* and the opinion expressed that many of the species now assigned to it belong in other genera including *Carlia*, *Didymellina*, *Metasphaeria*, *Didymosphaeria*, *Diaporthe*, etc. The taxonomic history of *Sphaeria cooperta* Desm. is reviewed and the conclusion reached that this species is properly referred to *Anistomula* v. H.; the new combination, *A. cooperta* (Desm.) v. H., is proposed. The fungus occurs on the under side of leaves of *Quercus coccifera*. A full description is given and its relationship with *Anistomula Quercus Ilicis* (Trav.) v. H. is discussed. *Leptosphaeria typharum* (Desm.) Karst. and *L. culmorum* Awld. are thought to be substratum forms of the same species. In this connection the relationship of *Leptosphaeria* de Not, *Scleroplella* v. H., and *Nodulisphaeria* Rbh. is discussed. The author does not agree with HASZLINSKY in considering *Gibbera vitis* Schulzer and *Valsa ampelina* (Fuck.) Nitschke identical with *Echusias vitis* Hasz. The latter genus is thought to be identical with *Fracchiaca* Sacc.; both genera were established in 1873. The latter name is preferred by the author and the new combination *F. vitis* (Hasz.) v. H. is proposed. Attention is called to certain errors occurring in the author's classification of the Diaporthaceae (Ber. Deutsch Bot. Ges. 25: 1917) and to certain additions to the same. These corrections and additions relate to the genera *Ophiognomonia*, *Valseutypella* v. H., *Neozimmermannia* Koorders, *Disperma* Thies., *Cryptonectriopsis* v. H., and *Plagiostomella* v. H. *Sphaeria cryptosphaeria* Fuckel is thought to be identical with *Ditopella fusispora* de Not. *Rehmiella Winter* is considered identical with *Ditopella* de Not, and *Rehmiella alpina* Winter is transferred to the latter genus. *Sphaeria protuberans* Fuckel as represented by the specimen distributed in F. Rhen. No. 2242 is also considered identical with *Ditopella fusispora*. Additional evidence is presented to support the opinion previously published by the author that *Diaporthe Krie-*

geriana Rehm is merely a *Euporthe* form of *Diaporthe coneglanensis* Sacc. & Speg. The occurrence of *D. marginalis* Peck in Europe on branches of the green alder is recorded and a description furnished. *D. cerasina* Rehm is considered to be only a form of *Valsa* (*Leucostoma*) *cincta* Fr., and the new combination and variety *Leucostoma cincta* (Fr.) v. H. var. *cerasina* (Rehm) v. H. is proposed; *Valsa sphaerostoma* Nitschke is thought to be the same.—H. S. Jackson.

2062. KEISSLER, KARL VON. Revision der von Sauter aufgestellten Pilze (an Handen dessen Herbars). [Revision of the fungi published by Sauter (on the basis of specimens in his herbarium).] *Hedwigia* 60: 352–361. 1919.—Sauter described between 1800 and 1881 a large number of fungi, chiefly discomycetes, and since his descriptions of these are very short and often inadequate, a knowledge of the type specimens in his herbarium has been desirable. Keissler has studied these and records his observations here. Of 143 species described by Sauter, he finds practically none to be valid.—H. M. Fitzpatrick.

2063. KILLERMANN, S. Neuer Fund von *Sarcosoma globosum* (Schmidel) Rehm bei Regensburg. [New discovery of *Sarcosoma globosum* near Regensburg.] *Hedwigia* 59: 313–318. Pl. 3, 2 fig. 1918.—The rediscovery of this rare fungus is announced, and the belief is expressed that it constitutes a valid genus and species.—H. M. Fitzpatrick.

2064. KILLIAN, CHARLES. Le développement du *Dothidella Ulmi* (Duv.) Winter. [The development of *Dothidella Ulmi* (Duv.) Winter.] *Rev. Gén. Bot.* 32: 534–551. Pl. 16–19. 1920.—The development of this organism causing a leaf-spot of the elm was studied morphologically and histologically. The paper is divided into 2 parts. The 1st part contains a detailed description of the development of conidia and ascospores. The 2nd part is a discussion and comparison of the morphology of *Dothidella* and other ascomycetes and the Uredinales. The author concludes that the ascomycetes and the Uredinales had a common ancestry.—J. C. Gilman.

2065. LUYK, A. VAN. Über *Gloeosporium Tremulae* (Lib.) Pass. und *Gloeosporium Populi-albae* Desm. [Concerning *Gloeosporium Tremulae* and *G. Populi-albae*.] *Ann. Mycol.* 17: 110–113. Fig. 1. 1919 [1920].—These species of *Gloeosporium* are considered identical with *G. circinans* (Fckl.) Sacc. and agree with it in having the spores, in part, united laterally by short connecting processes into complex groups of various shapes. Based upon this character, *Titaeosporina* is proposed as a new genus of the Melanconiaceae-Hyalosporae with *T. Tremulae* (Lib.) van Luyk as the type species. A full synonymy and description is furnished. The hosts are *Populus alba*, *P. tremula*, and *P. canescens*. The genus is thought to be analogous to *Titaeospora* Bubak but differs from the latter in the absence of septation in the spores.—H. S. Jackson.

2066. ORTON, W. A. Compilation of list of new fungi. *Phytopathology* 11: 29–30. 1921.—“The British Mycological Society intends to publish the original diagnoses of the genera of fungi which have appeared since the last volume (22) of Saccardo’s *Sylloge*, and to keep the list up to date by annual installments. Doctor J. Ramsbottom, general secretary of the Society, British Museum (Natural History), Cromwell Road, London, S. W. 7, has undertaken to compile this list, and would welcome separates in which new genera have been described, or assistance in any way. It is believed that the list will be valuable to all interested in mycological studies.”—H. M. Fitzpatrick.

2067. OUDEMANS, C. A. J. A. *Enumeratio Systematica Fungorum*. [A systematic enumeration of fungi.] Vol. 1. cxxvi + 1230 p. Martinus Nijhoff: The Hague, 1919.—This is the 1st volume of a 5 volume set. The 4 additional volumes will appear at irregular intervals. The work constitutes a host index enumerating all fungi living as parasites on the plants of Europe. Citations to mycological literature have been added to the names of the fungi listed, thus making possible the location of the original references to the parasitism of each

fungus mentioned. The host plants are arranged according to the Engler system. Volume 1 includes all hosts belonging to the lower groups of plants up to and including the Monocotyledons, volumes 2, 3, and 4 will embrace the dicotyledons, and volume 5 will serve as an alphabetical register for the 4 preceding volumes. The fungi are arranged by families under the name of the host, the families of each of the primary subdivisions of the fungi being grouped together. The organs of the host on which the fungus occurs are also indicated. Only the flora of Europe is covered but the term "European plant" is used in its broadest sense, any plant found in the living state in Europe, whether wild or cultivated, native or introduced, being included. Although the author died in 1906 the work has been completed up to 1910 by collaborators, and the whole is published under the direction of the Hollandsche Maatschappij van Wetenschappen of Haarlem. The work represents an attempt to meet a need long-felt by mycologists for a host-index, a need hitherto very imperfectly supplied by volume 13 and succeeding volumes of Saccardo's *Sylloge Fungorum*.—*H. M. Fitzpatrick.*

2068. OUDEMANS, C. A. J. A. *Enumeratio Systematica Fungorum*. [A systematic enumeration of fungi.] Vol. 2. *xix* + 1069 p. Martinus Nijhoff: The Hague, 1920.—The 2nd volume of the publication discussed in the preceding entry. This volume contains hosts belonging to the 17 families of the dicotyledons—Salicaceae to Basellaceae inclusive.—*H. M. Fitzpatrick.*

2069. PETRAK, F. *Mycologische Notizen*. [Mycological notes.] *Ann. Mycol.* 17: 59–100. 1919 [1920].—*Phomopsis pustulata* Sacc. is transferred to *Sclerophoma*; a detailed description is given, also a comparison with *Sclerotiopsis protracta* (Sacc.) Died. and *Myzofusicoccum obtusulum* (Sacc. & Br.) Died. A *Cytospora* stage of *Valsella polyspora* Nke. is described which is considered identical with *Cytospora personata* Fr. Evidence is presented to show that *Valsella polyspora* and *V. adhaerens* Fekl. are probably merely many-spored forms of *Valsa Auerswaldii* Nke. *Dothidella ribesia* (Pers.) Theiss. and Syd. is transferred to *Phragmodothella* and a full synonymy given, with which the American species *P. Kelseyi* (Ellis & Ev.) Theiss. & Syd. (*Homostegia Kelseyi* Ellis & Ev.) is questionably included. *Phomopsis juglandina* (Fekl.) v. H. is described in full together with a *Fusicoccum*-like form which is considered an abnormal type of the *Phomopsis*. *Septoria Meliloti* (Lasch.) Sacc. (*Sphaeria Meliloti* Lasch.), *Ascochyta caulicola* Laubert, *Stagonospora carpathica* Bäum., and *S. Medicaginis* (Desm. & Rob.) v. H. are all considered to be identical with *S. compta* (Sacc.) Died., and the new combination *S. Meliloti* (Lasch.) Petrak is proposed and full synonymy given. A detailed description is given of a form of *Phomopsis ribesia* (Sacc.) Died. which is stated to be the spermatogonial form of *Diaporthe purgens* Nke. The latter is considered merely a form of *D. strumella* (Fr.) Fekl. An *Othia* on *Ligustrum* is described which is considered identical with *Othia Crataegi* Fekl.; *Diplodia ligustrina* West was collected in association with it but it is not thought to be the conidial stage since 2 species of *Didymosphaeria* were also found either of which might be the ascogenous stage of the *Diplodia*. *Phleospora Hrubyana* Sacc. on *Spiraea chamaedrifolia* is described and considered identical with *Septoria magnusiana* Allesch. In this connection the relationship and limitations of the genera *Phleospora*, *Septoria*, *Cylindrosporium*, and *Septogloeum* are discussed and the following new combinations proposed: *Phleospora platanoides* (Allesch.) Petrak (*Septoria seminalis* Sacc. var. *platanoides* Allesch.), *P. heraclei* (Lib.) Petrak (*Ascochyta heraclei* Lib.), *P. padi* (Karst.) Petrak (*Cylindrosporium padi* Karst.), *P. magnusiana* (Allesch.) Petrak (*Septoria magnusiana* Allesch.). The conclusion is reached that *Diaporthe spiculosa* (Alb. & Schw.) Nke. and *D. circumscripta* Oth. occurring on *Sambucus* spp. are identical, being merely growth forms of the same species. Likewise the 2 conidial forms assigned to these species, *Phoma sambucella* and *P. sambucina*, are the same and should be cited as *Phomopsis sambucina* (Sacc.) Trev. A new genus, *Keisslerina*, regarded as closely related to *Dothiora*, is founded on a hitherto undescribed species, *K. moravica*, occurring on dry twigs of *Evonymus europaea*; *Dothichiza evonymi* Bub. & Kab. is the conidial stage. An immature ascomycete, presumably a species of *Botryosphaeria*, is described which is considered to be the probable ascogenous stage of *Botryodiplodia Frazini* (Lib.) Sacc., with which it was associated and of which a full description is given. *Dothiorella Frazini* (Lib.) Sacc. is thought to be merely a young development of the same species; likewise

a fungus identified as *Fusicoccum Forsythiae* Died., occurring on branches of *Forsythia*, *Syringa*, *Ligustrum*, and *Cornus* is considered identical. A full synonymy is given but no name is applied to the ascomycete form on account of its immaturity. *Stigmatea moravica* Petrak is redescribed in detail from a recent collection of material showing unusually rich development. It is shown that the fungus belongs in the Hypocreaceae, and *Nectriella moravica* Petrak is proposed as a substitute name. A new genus, *Cytoplacosphaeria*, founded on *Placosphaeria rimosa* Out., is proposed which differs from other genera of the Sphaeroidaceae in the relation of the pycnidia to the stroma. The author disagrees with von Höhnelt in considering this species the conidial stage of *Scirrhia rimosa* (Alb. & Schw.) Fekl.; it is suggested that *Diplodina arundinacea* Sacc. may possibly be identical. *Cytosporina Rubi* Died. is considered identical with *Rhabdospora ramealis* Desm. & Rob. and the new combination *Cytosporina ramealis* (Desm. & Rob.) Petrak is proposed. A detailed description is given of a *Phomopsis* which is considered to be the conidial form of *Diaporthe Winteri* Kunze and the new combination *Phomopsis Winteri* (Kunze) Petrak is proposed. *P. crataegicola* n. sp. occurring on dry twigs of *Crataegus oxyacantha* is described and thought to be a conidial stage of *Diaporthe Crataegi* Fekl. The author distinguishes the latter from *D. semiimmersa* Nke. A detailed description is given of *Phoma chamaeropsis* Cooke occurring on *Chamaerops humilis* and the new combination *Phomopsis chamaeropsis* (Cooke) Petrak is proposed. The suggestion is made that *Phyllosticta magnusii* (Bomm. & Rouss.) Allesch. and *P. cocoina* (Cooke) Allesch. var. *Phoenixis* (Brun.) Allesch. are substratum forms of the same species. *Pseudopleospora* is proposed as a new genus of ascomycetes, with *P. ruthenica* n. sp., on decorated stems of *Eupatorium cannabinum*, as the type species; its relationships are uncertain, it possibly belonging near the Hypodermataceae. The author suggests that it may represent a distinct family. *Peltosphaeria Petrakiana* Rehm is redescribed and transferred to *Dothiora*; *Dothichiza fallax* Sacc. is thought to be the conidial stage. *Fusicoccum hranicense*, on dry twigs of *Ulmus campestris*, formerly confused with *Phomopsis oblonga*, is described as a new species. *Neokeissleria* is proposed as a new genus, based on *Ceriospora ribis* P. Henn. & Ploettner; a description with full synonymy is given. The relationship of this new genus with *Ceriospora* and *Melanconis* is discussed in detail. *Phomopsis phyllophila*, on dry overwintered leaves of *Trifolium repens*, is described as new. *Phomopsis pyrrhocystis*, on dry twigs of *Corylus avellana*, is also described as new and is thought to be the spermagonial form of *Diaporthe pyrrhocystis* (Berk. & Br.) Fekl., with which it was found associated. *Karstenula ligustrina* n. sp., on dry sprigs of *Ligustrum vulgare*, is described and thought to be the ascogenous stage of *Microdiplodia mamma* Allesch. *Cucurbitaria moravica* Rehm is transferred to *Karstenula*; *Microdiplodia Pruni* Died. was found in association with it. *Chaetocystostroma*, showing relationship with *Fusicoccum*, is proposed as a new genus based on an hitherto undescribed species, *C. arundinacea*. The genus differs from *Fusicoccum* in the small spores and a hairy stroma. A new genus of the Nectroidaceae, *Blennoriopsis*, is described, based on *B. moravica* n. sp., on stems of *Linaria genistifolia*. *Diaporthe abnormis* v. H. is considered identical with *D. occulta* (Fekl.) Nke. (*Calospora occulta* Fekl.). The latter is made the basis of a proposed new genus, *Macrodiaporthe*, which is stated to differ from *Diaporthe* in that the stroma develops only above with the perithecia free below, the walls of the latter being thick and leathery and the spores and asci very large. A full synonymy is given. The author agrees with von Höhnelt in considering *Diaporthe oncostoma* and *D. fasciculata* on *Robinia* identical, and accepts his view that *D. leiphaemia* and *D. dryophila* on *Quercus* are the same; also that *D. Radula* and *D. oligocarpa* are identical. But he does not agree that *D. Crataegi* and *D. semiimmersa* are one species. *D. brachyceras* on *Ligustrum*, *D. crassicolis* on *Cornus*, *D. simulans* on *Rosa* agree with forms on Pomaceae and *Prunus* investigated by von Höhnelt. The author does not agree with von Höhnelt in separating the genus into *Euporthe*, *Tetrastaga*, and *Chlorostate*, and thinks that this treatment only serves to complicate the situation. Some general discussion of the genus is given and the importance of more culture work is emphasized. *Diaporthe Delogneana* Sacc. & Roum. and *D. helici* Niessl. are considered identical and a detailed description is given. A new genus, *Phaeodiaporthe*, based on *P. Keissleri* n. sp. occurring on twigs of *Aesculus hippocastanum*, is described. It differs from *Diaporthe* in the dark colored spores.—H. S. Jackson.

2070. SKAIFE, S. H. Notes on some South African Entomophthoraceae. Trans. Roy. Soc. South Africa 9: 77-86. Pl. 2-4. 1921.—Records of South African Entomophthoraceae published up to the present are confined to writings on the locust fungus, *Empusa grylli*. In the present paper the occurrence of 6 species is recorded and notes have been made on their morphology. These species are: *Empusa muscae*, *E. conglomerata*, *E. grylli*, *Entomophthora aphidis*, *E. apiculata*, and *E. megasperma*.—E. M. Doidge.

2071. STORK, HARVEY E. Biology, morphology and cytoplasmic structure of *Aleurodiscus*. Amer. Jour. Bot. 7: 445-456. 3 pl. 1920.—*Aleurodiscus amorphus* grows on twigs and small branches of fallen balsam fir. A small species of *Tremella* is often parasitic on the fruiting bodies of this species, sometimes covering them entirely. The mycelium of *Aleurodiscus* grows throughout the intercellular spaces of the bark parenchyma, originating as a mass of densely woven hyphae in the deeper tissues, from which hyphae move upward, breaking through the bark and producing the typical fruit body. In the cytoplasm are large filaments and numerous granules, which are thought to be in a class with mitochondria, metachromatic bodies, and other structures that have been described in the cytoplasm of fungi.—E. W. Sinnott.

2072. SYDOW, H., UND P. [SYDOW] Aufzählung einiger in den Provinzen Kwangtung und Kwangsi (Süd-China) gesammelter Pilze. [Enumeration of some fungi collected in the provinces of Kwangtung and Kwangsi, South China.] Ann. Mycol. 17: 140-143. 1919 [1920].—Thirty two fungi of various groups, mostly parasitic species, collected by O. A. REINKING in May and June, 1919, are listed. The following new species are described: *Physopella sinensis* on *Cudrania* sp.; *Ustilago Apludae* in spikes of *Apluda mutica* var. *aristata*; *Eutypella Paliuri* on branches of *Paliurus ramosissimus*; *Phyllachora cantonensis* on *Litsea glutinosa*; *Helminthosporium Rhodomyrti* on *Rhodomyrtum tomentosa*. A new genus of uncertain position in the Fungi Imperfecti, *Plenophysa*, based on an hitherto undescribed species, *P. mirabilis*, occurring on leaves of *Ficus elastica* and *Zea mays*, is described.—H. S. Jackson

2073. SYDOW, H., UND P. [SYDOW] Über einige Uredineen mit quellbaren Membranen und erhöhter Keimporenzahl. [Concerning some Uredinales with gelatinous membrane and more than the usual number of germ pores.] Ann. Mycol. 17: 101-107. 1919 [1920].—Seven species of rusts of the Pucciniaceae having teliospores with a gelatinous outer wall and in some cases more than 1 germ pore. The authors decide that *Uredo cristata* Speg., from Paraguay on a Sapindaceous host, and *U. Toddaliae* Petch, from Ceylon on *Toddalia aculeata*, are not uredo but telio forms, the teliospore wall in each consisting of 2 layers, the inner colored and firm, the outer strongly echinulate and swelling considerably in water. For these species they establish a new genus, *Ctenoderma*. The necessity for a division of the genera *Puccinia* and *Uromyces* as now used is reviewed and the divisions proposed by ARTHUR and FISCHER are discussed. The authors give their ideas as to such divisions and propose 2 new genera, *Dichlamys* and *Trochodium*, for species of *Uromyces* with gelatinous teliospore walls. *Dichlamys* is founded on *Uromyces Trollipi* Kalchr. & McOwan, characterized by the apical germ pore and striations or ribs on the teliospores. *Trochodium* is founded on *Uromyces Ipomoeae* (Thuem.) Berk. from South Africa and is characterized by apically grooved teliospores with radial ribs and a swollen pedicel. The genus *Haplopyxis* is proposed for *Uropyxis*-like rusts having 1-celled teliospores; *Uropyxis Crotolariae* Arth. is the type. The possibility of *Uromyces dubiosus* P. Henn. on *Lantana* from Brazil representing a new genus is discussed. *Puccinia Adesmiae* P. Henn. on *Adesmia trijuga* from Argentina is transferred to the genus *Cleptomyces*.—E. B. Mains.

2074. THAXTER, ROLAND. Second note on certain peculiar fungus-parasites of living insects. Bot. Gaz. 69: 1-27. 5 pl. 1920.—New genera and species are described in several groups. *Cantharosphaeria* is a new genus of true ascomycetes, 1 species, *C. chilensis*, being described; this may be saprophytic, but the species noted below are certainly parasites. *Termitaria* is a new genus of the Fungi Imperfecti, perhaps referable to the Leptostromataceae, but quite isolated in its characters; *T. Snyderi* and *T. coronata* are described. In *Mutogone*

and *Muiaria*, previously described genera of the Dematiaceae, *Muiogone Medusae*, *Muiaria curvata* and *M. fasciculata* are described as new. *Aposporella* is a new genus of the Mucedineae, 1 species, *A. elegans*, being described. Of uncertain affinities are the new genera *Coreomycetopsis* (1 species, *C. oedipus*, being described), *Endosporella* (with 1 species, *E. Diopsidis*), and *Laboulbeniopsis* (with 1 species, *L. Termitarius*). New species of previously described genera, also of uncertain affinity, are *Thaxteriola nigromarginata*, *Amphoromorpha Blattina*, and *Enterobryus compressus*.—H. C. Cowles.

2075. THOM, CHARLES, AND MARGARET B. CHURCH. *Aspergillus flavus*, *A. oryzae*, and associated species. Amer. Jour. Bot. 8: 103-126. 1 fig. 1921.—Fermented food products from the Orient show a number of types of *Aspergillus*, some of the more characteristic and important of which were studied in cultures. These are *A. flavus*, *A. oryzae*, *A. parasiticus*, *A. effusus*, *A. Wentii*, *A. tanari*, *A. terricola*, and *A. citrisporus*. Detailed cultural descriptions of these species are presented and their nomenclature, with that of related species, is discussed. A new variety, *A. terricola* var. *americana* Marchal is described.—E. W. Sinnott.

2076. WILL, H. Altes und Neues über die Riesenkolonien der Saccharomyceten, Mycoderma Arten und Torulaceen. [Some observations regarding giant colonies of *Saccharomyces*, *Mycoderma* spp. and *Torulaceae*.] Centralbl. Bakt. II Abt. 50: 1-23, 294-310, 317-335, 410-415. Pl. 3. 1920.—In this series of articles the author sums up the observations made by him on a large number of so-called giant colonies of the more commonly known species of *Saccharomyces*, *Pichia*, *Willia*, *Mycoderma*, and *Torulaceae*. He describes in great detail these giant colonies, which occur both on solid and liquid media; the factors which influence the development of the different growth forms; the zone formation which is very general in species of *Saccharomyces*; and finally classifies the giant colonies into fundamental types. The author thinks that these colonies represent one of the most important diagnostic characters for organisms of this type.—Anthony Berg.

2077. YASUDA, ATSUSHI. Eine neue Art von *Hypocrea*. Bot. Mag. Tôkyô 34: 1, 2. 2 photo. 1920.—*Hypocrea japonica* Yasuda is described and illustrated.—L. L. Burlingame.

LICHENS

2078. BACHMANN, E. Die Beziehung der Knochenflechten zu ihre Unterlage. [The relation of the bone lichens to the substratum.] Centralbl. Bakt. II Abt. 50: 368-379. Fig. 9. 1920.—The term bone lichen should not be given the same value as the commonly adopted term lime lichen as this latter form, at least the endolithic type, can use only calcium carbonate as a substratum while the bone lichen is found only occasionally upon bone, more commonly on wood, stone, or earth. The object of the present investigation was to determine the relation of these lichens to their newly adopted substratum. Three species were examined, *Bacidia albicans* (Hepp) Zwachk; *Lecidea goniophilia* Flk.; and *Caloplaca pyracea* (Ach.). Of these only the last is a lime lichen. Examination of *Bacidia albicans* on bones from 3 localities showed that the lichen was attached externally only as in the exolithic lichens *Catillaria micrococca* and *Bacidia Arnoldia* upon lime and *Scolicosporum compactum* and *S. umbrinum* on silicate rock. However, due to the great porosity of some bone substances the lichen forces its way into and partly fills the pores and galleries. Its growth upon bone free from pores is exolithic; upon highly porous bone, partly exotitic and partly hypostitic. *Lecidea goniophilia* exists also exotitically and hypostitically on bone, never as an epilithic or even as an endolithic lichen upon lime. *Caloplaca pyracea* (Ach.), which grows epilithically on lime stone, does not dissolve the bone substances, but seems to possess a greater mechanical power of forcing itself deeper into the pores of the substratum than does *Lecidea goniophilia*. The thalli of these lichens when grown on bone develop more vigorously and contain more gonidia than when growing on lime or some barks. Bone is therefore a very favorable substratum for the development of lichens, not because it furnishes certain nutrients but because of its great capacity of absorbing and retaining water.—Anthony Berg.

2079. LETTAU, G. Schweizer Flechten. I. [Swiss lichens I.] Hedwigia 60: 84-128. 1918.—Lists of lichens collected at various points in Switzerland, with descriptive notes. [See also following entry.]—*H. M. Fitzpatrick.*

2080. LETTAU, G. Schweizer Flechten. II. [Swiss lichens II.] Hedwigia 60: 267-312. 1919.—A continuation of a previous paper by the author (see preceding entry), and giving lists of lichens with descriptive notes, based on collections made at additional points in Switzerland.—*H. M. Fitzpatrick.*

2081. ZAHLBRUCKNER, A. Flechtensystematische Studien. I. Die Flechtengattung *Rhabdospora* Müll. Arg. [Systematic studies on lichens. I. The lichen genus *Rhabdospora*.] Hedwigia 59: 301-304, 305, 306. 2 fig. 1917, 1918.—A critical study of the morphology of the thallus and fruit-body. The genus is said to differ from *Bactrospora* in that the algal component belongs to the Cyanophyceae, and in that the fruit-body is pyrenocarp.—*H. M. Fitzpatrick.*

2082. ZSCHACKE, HERMANN. Die mitteleuropäischen Verrucariaceen. [The Verrucariaceae of middle Europe.] Hedwigia 60: 1-9. 1918.—Brief notes on species of *Staurothele* and *Polyblastia*.—*H. M. Fitzpatrick.*

BACTERIA

2083. BARNES, W. H. The activity of staphylococci in milk. Jour. Infect. Diseases 28: 259-264. 1921.—The growth of staphylococci in milk is suggested as a factor in their classification, due to the variety of reactions obtained.—*Selman A. Waksman.*

2084. HANER, R. C., AND W. D. FROST. The characteristics of the microcolonies of some pathogenic cocci. Jour. Infect. Diseases 28: 270-274. 2 pl. 1921.—A new method of drying down and staining colonies of bacteria only a few hours old is described and a study is made of microcolonies of some staphylococci, streptococci, and pneumococci.—*Selman A. Waksman.*

2085. RAHN, OTTO. Versuche einer natürlichen Gruppierung der Bakterien. [An attempt at presenting a natural classification of the bacteria.] Centralbl. Bakt. II Abt. 50: 273-293. Fig. 2. 1920.—A theoretical discussion of the origin and inter-relationships of the various groups of the bacteria. No detailed system of classification is outlined, the results of the inquiry being chiefly negative.—*H. M. Fitzpatrick.*

PALEOBOTANY AND EVOLUTIONARY HISTORY

E. W. BERRY, Editor

(See also in this issue Entries 2007, 2008)

2086. ARBER, E. A. NEWELL. Devonian floras, a study of the origin of Cormophyta. 100 p., 47 fig. Cambridge Univ. Press: 1921.—An incomplete summary of Devonian plants results in considering them to represent 2 radically different types,—an earlier, termed the *Psilophyton* flora or *Procormophyta*, and a later, termed the *Archaeopteris* flora. The former, possibly comprising the genera *Psilophyton* (which Arber considers identical with the petrified material known as *Rhynia*), *Ptilophyton*, *Thursophyton*, *Barrandeina*, *Barinophyton*, and *Taenioerada*, are considered as *Thallophyta* which anatomically were intermediate between algae and vascular plants. The latter, comprising the genera *Sphenophyllum*, *Pseudobornia*, *Archaeopteris*, *Rhacopteris*, *Bothrodendron*, etc., are considered true pteridophytic plants closely related to their descendants of the Lower Carboniferous.—The *Sphenophyllum*-*Calamite*-*Equisetum* line, the fern line, and the *Lepidodendron*-*Sigillaria*-*Lycopod* line are considered unrelated and independent derivatives of algal ancestors. The existing *Psilotales* are considered to represent a relatively modern group resulting from the transmigration of algae and not related to the *Psilophytales*, and the *Bryophyta* are considered to have had a like indepen-

dent origin late in geologic time. The complex wood of seed plants of the Cordaitan plexus in Devonian time is ignored. The stages in the evolution of steles are considered to be from a monarch type consisting of a single protoxylem group and formed by the simultaneous modification of a set of procambial elements, occurring independently in the axis and branches. Second, by the substitution of continuous for purely initial transformation; and third, by the formation of secondary cambium and secondary wood.—*E. W. Berry.*

2087. BENSON, W. N., W. S. DUN, AND W. R. BROWNE. Part IX. The geology, palaeontology and petrography of the Currabubula district, with notes on adjacent regions. B. Palaeontology, including CHAPMAN, F. Appendix. Lower Carboniferous limestone fossils. Proc. Linn. Soc. New South Wales 45: 337-374. Pl. 18-24, fig. 10-17. 1920.—Mention is made of leaf impressions of *Rhacopteris*, *Aneimites*, and *Archaeocalamites*, and descriptions are given of 2 sets of silicified plant remains. LAWSON is credited with the descriptions. Chapman also reports the presence of the thread-like thallus of a species of *Girvanella* (Cyanophyceae) in oolitic limestone from the Lower Carboniferous. Besides the fine tube of the thallus he observed here and there indications of strings of minute globular cells (probably reproductive).—*Eloise Gerry.*

2088. CARPENTIER, A. Notes Paléophytologiques sur le Westphalien du Nord de la France. [Paleophytological notes on the Westphalien of the north of France.] Ann. Soc. Géol. Nord. 44: 137-150. Fig. 3, pl. 2. 1920.—Five sigillarias including 2 new varieties, 1 lepidodendron, 4 ferns including a new *Taeniopteris* (?), and a seed called *Neuropterocarpus* which is associated with the fronds of *Neuropteris rarinervis*, are described from the Westphalian stage (Carboniferous) of the Departments of Nord and Pas-de-Calais in France.—*E. W. Berry.*

2089. FRITEL, P. H. Sur la présence des genres *Phragmites* Trin. et *Nephrodium* L. C. Rich. dans les argiles pleistocenes de Benenitra (Madagascar). [On the presence of *Phragmites* and *Nephrodium* in the Pleistocene clays of Benenitra in Madagascar.] Compt. Rend. Acad. Sci. Paris 171: 1389-1390. 1920.

2090. MACBRIDE, E. W. Recapitulation and descent. Nature 106: 280-281. 1920.

2091. NUTTING, C. C. Is Darwin shorn? Sci. Monthly 12: 127-136. 1921.—This is a criticism of "A critical glance at Darwin" by John Burroughs in the August (1920) number of the Atlantic Monthly.—DEVRIES, JENNINGS, CASTLE, WILSON and DAVID STARR JORDAN are quoted to show that Darwin's theory of natural selection is not repudiated by scientists.—*L. Pace.*

2092. SCOTT, D. H. Studies in fossil botany. Vol. 1. Pteridophyta. 3rd ed., xxiii + 434 p., 190 illus. A. & C. Black Ltd.: London, 1920.—The 3rd edition of this well known text contains little that was not in the 2nd edition except for a summary of the results of the work of KIDSTON & LANG on the petrified Devonian plants from the Rhynie chert of Scotland. These are recognized as constituting the basis for a new order—the Psilophytales, as proposed by the authors mentioned.—*E. W. Berry.*

2093. WALKOM, A. B. Mesozoic Floras of New South Wales. Pt. 1. Fossil plants from Cockabutta Mountain and Talbragar. Mem. Geol. Surv. New South Wales Palaeontol. 12: 1-21. 7 pl. 1921.—A number of Mesozoic types, largely cosmopolitan forms, are recorded. The genera represented are *Cladophlebis*, *Coniopteris*, *Thinnfeldia*, *Taeniopteris*, *Podozamites*, *Araucarites*, *Brachyphyllum* (?), *Elatocladus*, and *Pagiophyllum* (?). *Araucarites grandis*, based on a large cone-scale, and *Thinnfeldia talbragarensis* and *T. pinnata*, are described as new. Attention is called to the absence of all traces of *Ginkgo* and *Baiera*. The flora is considered to be of Jurassic, and probably lower Jurassic, age.—*E. W. Berry.*

PATHOLOGY

G. H. COONS, *Editor*C. W. BENNETT, *Assistant Editor*

(See also in this issue Entries 1606, 1614, 1618, 1842, 1930, 1937, 1959, 1968, 1974, 1997, 1998, 2061, 2063, 2065, 2067, 2069, 2071, 2072, 2188, 2195, 2202, 2227)

PLANT DISEASE SURVEY; REPORTS OF DISEASE OCCURRENCE AND SEVERITY

2094. ANONYMOUS. The mosaic disease of the sugar cane in Trinidad. [Rev. of: WILLIAMS, C. B. The mosaic disease of the sugar cane in Trinidad. Bull. Dept. Agric. Trinidad and Tobago 19, part 1. 1920.] Internat. Sugar Jour. 23: 74-75. 1921.

2095. KIRBY, R. S., AND H. E. THOMAS. The take-all disease of wheat in New York State. Science 52: 368. 1920.—Early in July 1920 attention was attracted to a small spot in a field of soft, red, winter wheat at East Rochester, New York. The plants were badly dwarfed and prematurely dead. In many cases secondary culms had been killed. Laboratory examination showed that the roots of the plants were rotted, and that the lower internodes were dark or entirely blackened and enveloped by a dense sheath-like plate of brown mycelium. Perithecia were found embedded in the leaf sheath and mycelial plate. Microscopic measurements of perithecia and ascospores agree very closely with those given by Saccardo for *Ophiobolus graminis*. Steps were taken to determine the source of infection and to completely eradicate the disease. No other evidence of take-all disease was found on this farm or on those in the vicinity. The crop from an area 40 feet in diameter was spread over the ground, gasoline was poured over the infected spot and vicinity, and the whole was then burned over.—A. H. Chivers.

2096. LEE, H. ATHERTON, AND MARINO G. MEDALLA. La enfermedad banda amarillo en Filipinas. The yellow stripe disease in the Philippines.] Sugar 23: 53-54. 1921.—Mosaic or yellow stripe disease of sugar cane as it occurs in various sugar countries is described with a brief mention of different control measures.—C. W. Edgerton.

2097. McCUBBIN, W. A. The potato wart situation. Potato Mag. 3^d: 5, 26-28. 2 fig. 1921.—The wart disease of potato (*Solanum tuberosum*) has been found in U. S. A. in 3 states, 58 towns and villages, and about 800 gardens covering less than 100 acres. Quarantine measures are in force, but need to be re-enforced by more complete surveys and by more feasible eradication methods than now exist. Immune varieties are being studied.—Donald Folsom.

2098. MONTEMARTINI, L. Alcune malattie nuove o rare osservate nel Laboratorio di Patologia Vegetale di Milano 22-26. [Some new or rare diseases observed in the Laboratory of Vegetable Pathology of Milan Nos. 22-26.] Rev. Patol. Veg. 10: 119-125. 1920.—A *Macrosporium* was found on the leaves of *Robinia pseudacacia* that were drying up, beginning at the margins and running in between the principal veins. Observations were made on the attack of the fungus *Clasterosporium amygdalearum* on an apricot tree that had remained immune though surrounded by severely affected cherries. However, it also was attacked when severely pruned. The pomegranate is described as a new host of *Hadrotrichum populi*. *Phyllosticta macrocarpae* is described as a new species causing a leaf spot that runs in between the lobes of the leaves of *Quercus macrocarpa*. A new form of a rust is described, based on the longer peridia of the aecia, namely, *Gymnosporangium clavariaeforme* (Jacq.) Rees f. *longissima* Montem., on *Crataegus oxyacantha*.—F. M. Blodgett.

2099. SIMMONDS, H. W., AND C. H. KNOWLES. A disease of *Clidemia hirta* in the lower Rewa District. Dept. Agric. Fiji Circ. 1. 9-12. 1920.—A disease was found to be destroying the plants of *Clidemia hirta*, which is a bad weed in this region. The external appearance of the diseased and dead plants is described. Efforts were made to determine the causal organ-

ism, but these have not yet been successful. It is thought that a species of *Heterodera* is primarily responsible.—C. V. Piper.

THE PATHOGENE (BIOLOGY, INFECTION PHENOMENA, DISPERSAL)

2100. HARVEY, R. B. Destruction of zoospores of plant disease organisms by natural enemies. *Science* 52: 84. 1920.—In making motion-picture photomicrographs of the liberation of zoospores from the sporangia of *Physoderma zeae-maydis*, the author observed destruction of the zoospores by certain animalcules which are commonly found in decaying vegetable material. The number of zoospores swallowed by one rotifer (*Proales* sp.) is very large. In starting with dry material collected from corn stalks infested with *Physoderma*, the animalcules appear first, and are on hand for each crop of zoospores.—A. H. Chivers.

2101. RAVAZ, L. Rapport sur le fonctionnement de la station d'avertissements agricoles de Montpellier, en 1918. [Report of the Agricultural Experiment Station of Montpellier, 1918.] *Ann. École Nation. Agric. Montpellier* 17: 131-167. *Fig. 1-27*. 1918 [1919].—The main part of the report is devoted to work with grape mildew (*Plasmopara viticola*). Temperature and humidity are considered the most important factors concerned in the development of this disease, and for this reason meteorological data are reported from various points in the grape-growing section. A minor part of the report consists of observations made on black rot [*Guignardia bidwellii*] and insects. A historical review of the station is also given.—F. F. Halma.

2102. SHUNK, I. V., AND F. A. WOLF. Further studies on bacterial blight of soybean. *Phytopath.* 11: 18-24. *Fig. 1*. 1921.—A comparison of the pathological symptoms of the bacterial blight of soybean (*Soja max*) described by COERPER in Wisconsin and that described by Wolf in North Carolina has shown only minor differences in the appearance of the diseased spots; but differences in the reactions and growth characteristics on various culture media were sufficient to prove the causal organisms distinct. The two diseases, one produced by *Bacterium glycinum* Coerper and the other by *B. sojæ* Wolf, are found in Wisconsin, but only the one produced by the latter organism has been found in North Carolina.—B. B. Higgins.

2103. THOMAS, H. E. The relation of the host and other factors to infection of *Apium graveolens* by *Septoria apii*. *Bull. Torrey Bot. Club* 48: 1-29. 1921.—The idea of specificity in the relation of plant parasites to their hosts is coming to be one that must be reckoned with; the obligate parasite is restricted in its host range and a slight change in either host or fungus may completely change the virulence of the parasite or its effect on the host. Data are presented in this paper to show that the infection of *Apium graveolens* by *Septoria apii* is favored by conditions which accelerate the growth of the host. Work with many hosts showed a high degree of specialization on the part of the parasite in its inability to cause infection. Experiments were conducted on host plants treated with various solutions to produce different degrees of health and vigor. Plants suffering from nematodes, and etiolated plants, were also used. The parasite's development was favored by increased growth in the host and showed a high degree of specialization. This specialization suggests promise for experiments in breeding for resistance.—P. A. Munz.

THE HOST (RESISTANCE; SUSCEPTIBILITY; MORBID ANATOMY AND PHYSIOLOGY)

2104. SCHLUMBERGER, O. Pflanzenschutz und Sortenfrage im Kartoffelbau. [The question of varieties and disease resistance in potato culture.] *Fühling's Landw. Zeitg.* 69: 144-149. 1920.—A general discussion of the problem of obtaining disease-resistant varieties of potatoes is presented. Pathological investigations of potato diseases and physiological studies of diseased and disease-resistant varieties or individual plants to determine the underlying causes of resistance or susceptibility to disease should be carried on in a systematic way to

arrive at fundamental principles upon which selection of disease-resistant sorts may be based. All new introductions should be tested in localities where particular diseases are prevalent.—*A. T. Wiancko.*

DESCRIPTIVE PLANT PATHOLOGY

2105. ANONYMOUS. The menace of the white pine blister rust. *Amer. Forestry* 27: 6. 1921.

2106. BIJL, P. A. VAN DER. Notes on some sugar cane matters. *Jour. Dept. Agric. Union of South Africa* 2: 122–128. *Fig. 1–5.* 1921.—Notes are given on the root disease caused by *Himantia stellifera*, leaf diseases (due to *Leptosphaeria sacchari* and *Helminthosporium sacchari*), and the stalk diseases caused by *Melanconium sacchari* and *Cephalosporium sacchari*. Reference is also made to the non-setting of seed in Uba and other cane varieties in South Africa.—*E. M. Doidge.*

2107. BOTTOMLEY, A. M., AND K. A. CARLSON. Parasitic attack on *Eucalyptus globulus*. A note on *Stereum hirsutum* in plantations in the Transvaal. *Jour. Dept. Agric. Union of South Africa* 1: 852–858. *Pl. 1–2.* 1920.—A parasitic attack of *Stereum hirsutum* on *Eucalyptus globulus* in gum plantations on the farm Cliffendale near Roodepoort is described. The disease is confined to stem tissues where it produces a characteristic soft dry rot which renders the timber useless for industrial purposes. An examination of the above and other plantations showed that the fungus was common as a saprophyte on old stumps and that Cliffendale was the only locality where it had become parasitic; and further that *E. globulus* was the only species of gum susceptible to the disease. The attack in this case was thought to be due probably to lack of vigor in the trees occasioned by unsuitable local conditions of soil or climate or both. Control measures advocated consist in growing only those species found to be most suitable to the area in question and in the destruction of all infected stumps by means of the saltpeter and kerosene oil method.—*A. M. Bottomley.*

2108. BROOKS, F. T., AND M. A. BAILEY. Silver leaf disease (including observations upon the injection of trees with antiseptics). *Jour. Pomology* 1: 81–103. 1920.—Reprinted with abridgments from *Jour. Agric. Sci.* 9: 189–215. 1919.—*L. H. MacDaniels.*

2109. CHEEL, EDWIN, AND J. B. CLELAND. Disease in forest trees caused by the larger fungi. *Forest. Commission New South Wales Bull.* 12. 12 p., *pl. 1–20.* 1918.—The author emphasizes the importance of the study of fungi causing decay of living trees, stored lumber, and building timbers, giving non-technical descriptions of various members of the genera *Armillaria*, *Pholiota*, *Polyporus*, *Polystictus*, *Fomes*, *Hexagona*, and *Trametes* which have been found or may be found causing decay of important woods. The plates illustrate the rots produced by, or the sporophores of, the following forms: *Armillaria mellea*, *Pholiota adiposa*, *Polyporus eucalyptorum*, *P. ochroleucus*, *P. gilvus*, *P. dryadeus*, *P. salignus*, *Polystictus versicolor*, *Fomes robustus*, *F. applanatus* var. *australis*, and *Trametes lactinea*.—*Reginald H. Colley.*

2110. DOIDGE, E. M. A tomato canker. *Jour. Dept. Agric. Union of South Africa* 1: 718–721. 1 *fig.* 1920.—A popular account of a bacterial disease of tomatoes caused by *Bacterium vesicatorium*.—*E. M. Doidge.*

2111. DUFRENOY, JEAN. Witches'-brooms of *Pinus maritima*. *Phytopathology* 11: 27. 1921.—Examination of hypertrophied tissues from witches'-brooms occurring on *Pinus maritima* in southwestern France showed the cambial cells generally infested by bacteria, which, when inoculated into young buds of *P. maritima*, killed the buds but failed to produce witches'-brooms.—*B. B. Higgins.*

2112. FRYER, P. J. Insect pest and fungus diseases of fruit and hops. *xv + 728 p., 24 colored pl., 305 fig.* Cambridge University Press: London, 1920.—The author has prepared

a "complete manual for growers," with the following plan of presentation. The book is divided into 11 "sections," distributed in 3 "parts":—Sect. I, Introduction; Sect. II, How fruit trees live. PART I, Insect pests and their control: Sect. III, About insects; Sect. IV, Insect pests; Sect. V, Insecticides; Sect. VI, Beneficial insects. PART II, Fungus diseases of fruit and their control: Sect. VII, Fungus diseases; Sect. VIII, Fungicides. PART III, Spraying in theory and practice: Sect. IX, Spraying appliances and methods; Sect. X, Spraying calendar; Sect. XI, Tables and appendices. Pests are considered by groups, and for each pest the data are presented in simple language in accordance with a standard outline. The first 476 pages of the book are used in the discussion of insect pests and their control. Fungus diseases of the apple, cherry, currant, gooseberry, hop, peach, pear, plum, raspberry, strawberry, and grape are considered in the following 151 pages. In the case of each fungus disease the data are presented wherever possible in a standard manner similar in plan to the scheme used in the section on insect pests. The description of spraying methods and outfits is comprehensive. The last 2 sections in the book are arranged so that the grower may easily find information on the spraying calendar or the tables of equivalents.—*Reginald H. Colley.*

2113. GRIESBECK, A. Die Erreger der Schwartxbeinigkeit bei Kartoffeln. [The causes of blackleg in potatoes.] Fühling's Landw. Zeitg. 69: 37–38. 1920.—While APPEL found *Bacillus phytophthorus* to be a cause of blackleg in potatoes he indicated that other organisms might contribute to the disease. The present author found that hollow places in the earth beside the potato stems caused by burrowing animals such as mice and moles were associated with the appearance of the disease. It is supposed that injury to the stem or merely the existence of the hollow space beside the stem causes dying of the tissues and gives access to moulds and rotting bacteria. It is suggested that hoeing to break up the animal burrows would cause partially affected stems to recover and that ridding the land of these burrowing animals would effectively control the disease.—*A. T. Wiancko.*

2114. MABEE, W. B., AND R. A. JEHLE. Insect pests and diseases of apples in North Carolina and their control. Bull. North Carolina Dept. Agric. 1921³: 1–24. 1921.—A popular illustrated account of apple scab, blotch, blackrot, bitter rot, sooty blotch, rust, stippen, and fire blight of apples, with remedial and control measures.—*F. A. Wolf.*

2115. NORTON, J. B. S., AND C. C. CHEN. Another corn seed parasite. Science 52: 250. 1920.—A fungus which seems to have been given little consideration as a parasite has recently been isolated by the authors from sweet corn seed. The fungus was frequently found in corn from a field that had many dwarf, distorted, and barren stalks, and some root rot. The fungus has been isolated and its pathogenicity tested. The tests show the same effects as in the field. The fungus corresponds very well with descriptions and figures of *Oospora verticilloides*. It is probable that the fungus has been recorded under other names.—*A. H. Chivers.*

2116. NOWELL, W., AND C. B. WILLIAMS. Sugar cane blight in Trinidad. [Reprint of Bull. Dept. Agric. Trinidad and Tobago 19, part 1. 1920.] Internat. Sugar Jour. 23: 154–155. 1921.—The fungi causing root disease of sugar cane, at present known in Trinidad, belong to the genera *Marasmius* and *Odontia*. They occur to some extent in all cane fields and become serious when the vigor of the cane is decreased by adverse factors. The prevalence of root disease over wide areas in Trinidad, reported last year, is due to the weakening of the cane by attacks of froghopper. The effect of root disease with or following froghopper injury prevents recovery of the cane. Control measures suggested are the reduction of the ratooning period, improved cultivation, manuring, and rotation of crops.—*C. Rumbold.*

2117. POETEREN, N. VAN. De Aardappelwratziekte. [Potato wart.] Tijdschr. Plantenz. 27: 1–13. Fig. 1–7. 1921.—A general discussion of potato wart (*Chrysophlyctis endobiotica*), including symptoms, cause, mode of dissemination, importance, distribution in general and in Holland, eradication, and legislative measures in Holland for the eradication of the disease. Distribution of this disease in Holland is limited to 5 townships which are located on the Ger-

man border. Experiments with resistant varieties are under way; so far, only the variety Ceres has proved resistant. The legislative measures are strict and far reaching, and complete eradication of the disease in Holland is being attempted.—*D. Atanasoff*.

2118. QUANJER, H. M. *Considerations nouvelles sur les maladies de la pomme de terre.* [Recent work on the diseases of potato.] Bull. Soc. Path. Veg. France 7: 102-118. 1920.—An address given under the auspices of the Phytopathological Society of France in Paris. A résumé of the recent work on the principal diseases of the potato is given with special attention to the mosaic disease and the results of the author's investigations which have already been published elsewhere.—*C. L. Shear*.

2119. SALISBURY, E. J. [Rev. of: BUTLER, E. J. *Fungi and disease in plants.* vi + 547 p., 5 pl., 205 fig. Thacker, Spink & Co.: Calcutta and Simla, 1918.] Sci. Prog. [London] 13: 677-678. 1919.

ERADICATION AND CONTROL

2120. ANONYMOUS. *Broeiproeven van tegen aaltjesziek behandelde Narcissenbollen.* [Heating experiments with nematodes in narcissus bulbs.] Weekbl. Bloembollencult. 30: 303, 312. 1920.—A number of narcissus bulbs were kept for 1, 2, and 3 hours in water at 110-111°F. to destroy nematodes. Treatment for 1 or 2 hours gave best results. Experiments were carried on with the following varieties: King Alfred, Emperor, Golden Spur, and N. Leeds Lucifer.—*J. C. Th. Uphof*.

2121. ANONYMOUS. *Control of the white pine blister rust.* Bien. Rept. New Hampshire State Forest. Commission 1919-1920: 39-52. 1920.—A systematic survey, begun with the discovery of the disease in 1916 and continued through 1920, has proved that the white pine blister rust is generally distributed in the pine regions of the state. As examples of the degree of infection the following cases may be cited: On a narrow strip 70 miles long in the Ammonoosuc Valley, 24 per cent of the pines were diseased; in the same region, on a plot of 43 acres, 55 per cent of the pines were diseased; both cultivated and wild *Ribes* were found to be generally infected in all areas scouted. There is only one known and proved method of checking the rust, and that is the removal of all *Ribes*. The amount of eradication work and the cost for 1917 compared with that of 1920, and the total work done, are shown in the table.

YEAR	TOWNS WORKED	ACRES COVERED	AVERAGE COST PER ACRE	WILD BUSHES DESTROYED	CULTIVATED BUSHES DESTROYED
1917.....	4	23,043	\$0.42	462,500	500
1920.....	49	203,641	0.175	2,057,936	21,298
1917 to 1920 total.....		457,389	0.227	5,139,704	51,396

A table giving the 1919 and 1920 costs for the individual towns is appended. The actual cost to the state for eradication of approximately half a million acres was about \$.05 per acre, the rest of the funds being furnished through cooperative agreement by the Federal government and the towns. Improved methods of advance surveys by men who mark areas requiring the attention of crews have reduced the cost and made possible the covering of a much larger acreage. The crews averaged better than 96 per cent eradicating efficiency. At the present rate 7 or 8 years more will be required to eradicate *Ribes* spp., from the whole state; and in view of the heavy potential loss to pine owners the work should be continued with all the funds which can be made available.—*Reginald H. Colley*.

2122. BRITTON, W. E., AND G. P. CLINTON. *Spray calendar.* Connecticut [New Haven] Agric. Exp. Sta. Bull. 224. 67-110. 1921.—This is the 5th revision of the spray calendar issued by the station. It includes brief descriptions, with preventive measures, of insects and fungi attacking 98 species of plants growing in the state. Methods are given for the prep-

aration of 16 insecticides and fungicides, 7 commonly used fungicides, and 6 less commonly used ones. Lists of manufacturers and dealers in spray machines and spray materials are included.—*Henry Dorsey.*

2123. CHEYNEY, E. G. Preliminary investigation of *Ribes* as a controlling factor in the spread of white pine blister rust. *Science* 52: 342-345. 1920.—The control of white pine blister rust, or rather the protection of white pine, depends on a definite knowledge of the habits of species of *Ribes*, especially of the wild plants. Projects were therefore planned to cover the following points: (1) To study the sprouting of different species of *Ribes* eradicated in different months and under different moisture conditions; (2) to study the cost and effectiveness of eradication in different months; (3) to determine the number of years eradication will have to be practiced; (4) to study the reproduction of different species of *Ribes* by seed and layering; (5) to determine the effect of pruning and cutting off the roots at different depths and at different dates; (6) to determine growth habits of different species. From experiments on the areas selected, namely, the Rush Lake region, Minnesota, the following results, though not conclusive, are significant: There was a higher percentage of sprouts from plants eradicated on the moist type of soil than on the dry or swamp types; a larger percentage of sprouts from plants which were grubbed than from plants which were pulled; tendency to sprout from the root ends seemed much stronger in plants pulled in May and June than late in summer; plants cut off above the crown almost invariably sprouted in all types and at all seasons, with the exception of the swamp species, *R. triste*. The number of large plants missed by eradication crews was very small (less than 5 per cent). The number of seedlings left was very much larger, but the leaf surface of these is very small. None of these seedlings was found to be infected, and is it questionable whether they live over to the second season in large numbers. It has been the practice in the state to pull the plants whenever possible rather than to grub them. Evidence indicates that the reverse practice would be preferable since it seems to be a fact that practically all sprouts come from pieces of crowns and from root ends which are exposed to light.—*A. H. Chivers.*

2124. DETWILER, S. B. Safeguarding the white pine crop. *Amer. Forestry* 27: 7-11. 8 fig. 1921.—A résumé of the conclusions reached by the Sixth Annual International Blister Rust Conference held in Boston, Massachusetts, under the auspices of the American Plant Pest Committee. It was the opinion of the conference that a zone 200-300 yards in width cleared of currant and gooseberry bushes, will insure the commercial growing of white pines under average conditions. In 1920 the cost of control in all states averaged 35 cents per acre as compared with 54 cents in 1919 and 66 cents in 1918. These figures include labor, supervision, and transportation of field men.—*Chas. H. Otis.*

2125. FIELDS, W. S., AND JOHN A. ELLIOTT. Making Bordeaux mixture, and some other spraying problems. *Arkansas Agric. Exp. Sta. Bull.* 172. 12 p., 1 pl. 1920.—The effect of different methods of mixing on the settling and deterioration of Bordeaux mixture is shown in tables and figures. Recommendation is made to dilute the CuSO_4 solution in the spray tank and to add the milk of lime while agitating the dilute copper solution. No appreciable differences in times of settling of lead arsenate in Bordeaux mixture and in lime-sulphur solution were found with waters of different degrees of hardness.—*John A. Elliott.*

2126. MELHUS, I. E., AND J. C. GILMAN. Measuring certain variable factors in potato seed treatment experiments. *Phytopath.* 11: 6-17. Fig. 1-5. 1921.—The 3 principal variable factors affecting the value of potato (*Solanum tuberosum*) seed treatment are: The presence of living pathogenes on the tubers after treatment; the continued antiseptic action of the solution used in the treatment; and the percentage of infection resulting from pathogenes already in the soil.—To study the 1st of these variables, scabby tubers were treated with solutions of formaldehyde and of HgCl_2 , varying the temperature, the strength of the solution, and the time of exposure. Tissue from scab sori of the treated and the untreated tubers was then plated and the numbers of resulting colonies of the scab organism (*Actinomyces scabies*) compared. Tubers dipped for $2\frac{1}{2}$ minutes in formaldehyde solution 1-120 at a temperature

of 50°C., and covered for 1 hour, were the only ones completely sterilized. It was found, however, that enough HgCl₂ solution remained on the surface of the tubers to exert a decided antiseptic action.—Similar tests were also made with both *Rhizoctonia solani* and *Spondylocladium atrovirens*.—By running a large number of checks with treated and untreated seed, it was found possible to measure the percentage of infection resulting from the presence of *Rhizoctonia* and *Actinomyces* in the soil.—*B. B. Higgins*.

2127. MÜLLER-THURGAU, H., UND A. OSTERWALDER. *Versuche zur Bekämpfung der Kohlhernie* [Experiments on the control of club root of cabbage.] Landw. Jahrb. Schweiz 1919: 1-22. *Fig. 1-7*. 1919.—Experiments on the control of club root (*Plasmiodiophora brassicae*) in kohlrabi and cabbage are described. Different forms of lime, sulphur and formalin were applied to the soil in various amounts. Burned lime and hydrated lime are said to have given satisfactory results.—*J. D. Luckett*.

2128. SANDERS, G. E., AND A. KELSALL. *Dusts and dusting for insect and fungus control*. Sci. Agric. [Canada] 1: 14-18. 1921.—This article gives results of dusting experiments in Nova Scotian orchards.—*B. T. Dickson*.

MISCELLANEOUS (COGNATE RESEARCHES, TECHNIQUE, ETC.)

2129. CHURCH, MARGARET B. *The relation of mosaic disease to pickling of cucumbers*. Phytopath. 11: 28-29. 1921.—Cucumbers visibly affected with mosaic disease do not make good dill pickles. They do not clear up properly in the brine.—*B. B. Higgins*.

2130. REDDICK, D. *Foot rot of tomato*. Phytopathology 11: 29. 1921.—The name "Foot rot" for the tomato disease caused by *Macrosporium solani* is claimed to be preëmpted because of previous use in connection with the disease caused by *Phytophthora cryptogea*. Use of generic names of causal organisms as descriptive adjectives is proposed.—*G. H. Coons*.

2131. [THOMPSON, M. R. H.] *Cold storage conditions for export*. Jour. Dept. Agric. Union of South Africa 2: 133-136. *Fig. 1-2*. 1921.—A report on the presence of organisms causing decay in fruit in cold storage rooms in Cape Town. It is stated that the condition of the rooms was satisfactory.—*E. M. Doidge*.

2132. WAGNER, ESTHER A., AND W. F. MONFORT. *Lactose broth for isolating Bacterium coli from water*. Amer. Jour. Public Health 11: 203-208. 1921.—The authors advise a broth containing 2 per cent peptone, 0.2 per cent lactose, and 0.001 per cent gentian violet, to be used with an equal volume of water. It is claimed that the use of the gentian violet makes possible sterilization of the medium by pasteurization in place of autoclaving, thus obviating the hydrolysis of the sugar which occurs at autoclave temperatures.—*C. A. Ludwig*.

PHARMACOGNOSY AND PHARMACEUTICAL BOTANY

HEBER W. YOUNGKEN, *Editor*

E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 1589, 2001)

2133. ANONYMOUS. *The Mulford Biological Exploration of the Amazon Basin*. Amer. Jour. Pharm. 92: 815-820. 1920.—A complete prospectus of the proposed Mulford Biological Exploration of the Amazon Basin, under the direction of Doctor Rusby.—*Anton Hogstad, Jr.*

2134. KREMERS, EDWARD. *Quarter of a century of chemical investigation of a typically American genus of plants*. Jour. Amer. Pharm. Assoc. 9: 1175-1176. 1920.—A portion of an address in which the author presents an explanation justifying the continuation of exhaustive research on a single genus, *Monarda*, which he has been actively engaged upon during the

past 25 years.—The author states that the horizon has grown wider and the subject more intensely interesting than ever before. He points to the recent discovery of a new terpene, possibly more correctly of 2 new terpenes; to the synthesis of new dyestuffs; and to the study of intramolecular changes of isomeric derivatives. The economic possibilities are not discussed.—*Anton Hogstad, Jr.*

2135. LLOYD, J. T. **Spiders used in medicine.** Amer. Jour. Pharm. 93: 18-24. Fig. 2. 1921.—An account of the use of spiders and spider webs in medicine, including a number of excerpts from historical literature on medicine. Owing to the popular lack of knowledge regarding the distinctive characteristics of spiders and insects, these characteristics are portrayed in a series of sketches. The author states he has handled large numbers of native spiders as well as hundreds of "banana tarantulas," which are not true tarantulas, and has found them all harmless. Although no chemical analyses of the spider web are known, tests have shown the absence of sugar; a slight reaction towards alkaloids has been observed. Spiders of the sub-family Aviculariinae, commonly known as "tarantulas" or bird spiders, are used by homoeopathic physicians. Until recently the web was administered in the form of a pill, but at the present time it is administered in the form of an alcoholic preparation known as "Tela Araneae."—*Anton Hogstad, Jr.*

2136. MITCHELL, D. T. **Poisoning of cattle by Diplodia-infected maize.** South African Jour. Sci. 16: 446-452. 1920.—A disease in cattle characterized by incoordination of movement and paralysis is produced by feeding mealy cobs which are infected with *Diplodia Zea*. Cultures of *D. Zea* grown on sterile maize produce clinical symptoms indistinguishable from those set up by feeding infected cobs.—*E. M. Doidge.*

2137. MITCHELL, D. T. **Poisoning of cattle by feeding on Paspalum dilatatum infected with Claviceps Paspali.** South African Jour. Sci. 16: 391-396. 1920.

2138. RUSSEL, G. A. **Rose geranium.** Jour. Amer. Pharm. Assoc. 10: 19-26. 1 pl. 1921.—The results of experiments in the culture of several varieties of rose geranium (*Pelargonium odoratissimum*) in Florida since 1914. The discussion embraces such factors as growth of plants; propagation by cuttings; cultivation; fertilization; harvesting; distilling and yield of herb and oil. The yield of oil was somewhat disappointing, varying from 0.035 to 0.109 per cent, depending upon the time of harvesting. Heavy rains were noted to cause a decrease in yield of oil. One acre yielded 16,720 pounds of fresh herb the 1st year, 7,618 the 2nd, and 4,499 the 3rd; it appears, therefore, that the amount of fresh herb obtainable decreases with each year of the life of the field.—The yield of oil per acre is not sufficiently large to warrant the cultivation of geranium as a money crop. An approximation of the possible monetary returns is presented on the basis of price paid for lowest-priced oil:

	1917	1918	1919
A	\$36-57	\$22-25	\$10-93
B	21-75	23-76	14-92

The author believes that plot B very nearly represents what may be expected from the cultivation of rose geranium as a money crop.—*Anton Hogstad, Jr.*

2139. SCHNEIDER, ALBERT. **A general method for making quantitative microanalyses of vegetable drugs and related substances.** Jour. Amer. Pharm. Assoc. 9: 1140-1153. 1920.—The method consists in making a count of the characteristic elements present in the substance in question, from a diluted suspension of a carefully prepared powder. After carefully grinding and mixing, 1 gr. of substance is suspended in 5 or 10 cc. of distilled water or a mixture of water and glycerine in a 25 cc. graduated cylinder. It is then thoroughly mixed with a glass rod and the cylinder filled to the 25 cc. mark with 5 per cent gum acacia solution, the entire mixture being thoroughly mixed. (Other suspending materials may be used, such as glycerine, oils, thin syrup, solution of cherry gum, solution of gum mastic, gelatin solution, india gum solution, vaseline, etc.) Of the mixture, 0.2 cc. are delivered upon a counting chamber or counting slide. The characteristic tissue elements are then counted and recorded.

Between 30 and 50 distinct fields can be counted in one mount. These findings are then compared with a standard. A list of some 78 substances with characteristic tissue elements upon which counts are to be based are included; for example, Cinchona, large bast cells; Conval-laria, number of raphides; Absinthium, T-shaped trichomes.—*Anton Hogstad, Jr.*

2140. VIEHOEVER, ARNO. **Chinese Colza. An adulterant of mustard seed.** Jour. Amer. Pharm. Assoc. 10: 16-19. 3 pl. 1921.—The seeds of Chinese Colza, also known as "Golden Gate," which strikingly resemble white mustard, were offered for sale as mustard. The author has identified the Chinese Colza as *Brassica campestris chinoleifera* Viehovever. The taste is that of cabbage rather than mustard and they lack the necessary physiological characters. The fatty oil, however, can be used for technical purposes and undoubtedly, if properly refined, as an edible oil.—The volatile oil was present to the extent of 0.4-0.6 per cent and was identified as "crotonyl mustard oil." This oil is only slightly pungent and has the flavor of cabbage or turnip. It was found to be non-poisonous to rabbits and to lack the pronounced bactericidal properties of the true volatile oil of mustard. Analyses of the air dried seeds yielded 23 per cent protein, 11.5 per cent reducing substances, and over 40 per cent ether extract. The press cake, which contains up to 10 per cent or more of fatty oil, should make a valuable feed product. The foliage should prove valuable as greens for salads, etc.—*Anton Hogstad, Jr.*

2141. YOUNGKEN, HEBER W. **Pharmaceutical botany, a text book for students of pharmacy and science.** 3rd ed., 479 p., 238 fig. P. Blakiston's Son & Co.: Philadelphia, 1921.—The 1st chapter comprises 32 pages on fundamental principles of nomenclature, classification, and microtechnique. The life histories of important type forms, such as *Dryopteris Filix-mas*, *Pinus strobus*, and *Erythronium americanum*, etc., are taken up in detail. Vegetable cytology and plant tissues are discussed and illustrated by a number of new drawings. There are 98 pages dealing with plant organs and organisms. The morphology and histology of root, stem, and leaf are discussed and amply illustrated. Drawings of the various types of fruits and inflorescences are included. The portion devoted to taxonomy covers the plant kingdom from the primitive bacteria to the highest of the drug-yielding dicotyledonous families, the Compositae. A chapter has been added on ecology, and a 24-page glossary defines the most important botanical terms used in the text.—*M. S. Dunn.*

PHYSIOLOGY

B. M. DUGGAR, *Editor*

CARROLL W. DODGE, *Assistant Editor*

(See also in this issue Entries 1589, 1590, 1814, 1827, 1830, 1869, 1937, 1959, 1973, 1978, 2007, 2023, 2047, 2049, 2134, 2217)

GENERAL

2142. ANONYMOUS. [Rev. of: BAYLISS, W. M. **Principles of general physiology.** xxiv + 858 p., 261 fig. Longmans, Green & Co.: London, 1918.] Sci. Prog. [London] 13: 507-508. 1919.

DIFFUSION, PERMEABILITY

2143. ADAIR, GILBERT SMITHSON. **The penetration of electrolytes into gels. II. The application of Fourier's linear diffusion law.** Biochem. Jour. 14: 762-779. 1920.

2144. LLOYD, DOROTHY JORDAN. **Note on the production of a contracting clot in a gel of gelatin at the iso-electric point.** Biochem. Jour. 14: 584-585. Pl. 1. 1920.—The conclusion is reached that gelatin gels are unstable at the iso-electric point. Small quantities of NaOH have the same stabilizing influence when added to the system as HCl. The formation of stable gels therefore is only possible in the presence of an electrolyte.—*A. R. Davis.*

2145. WIGGANS, R. G. Variation in the osmotic concentration of the guard cells during the opening and closing of stomata. Amer. Jour. Bot. 8: 30-40. 7 fig. 1921.—Determinations of the osmotic concentration of the guard cells and epidermal cells of *Zebrina pendula*, *Iresine*, *Cyclamen*, and the beet were made by placing pieces of the epidermis in calcium chloride solution of different densities and noting the concentration at which plasmolysis took place. There was little change in the osmotic concentration of the epidermal cells during the day. The concentration of the guard cells increased in the early hours of sunshine and decreased in the afternoon, approaching the concentration of the epidermal cells at nightfall. It was always higher in the guard cells than in the epidermis, though the differences were not as great as those reported by ILWIN. Concentrations were in all cases higher in experiments carried on at Columbia, Missouri, than at Ithaca, New York.—E. W. Sinnott.

WATER RELATIONS

2146. JOHNSTON, E. S. A method of studying the absorption-transpiration ratio in nutrient media. Science 52: 517. 1920.—Several writers have shown that the water content of plants varies with the hour of the day. Wilting takes place when the ratio of the rate of entrance to the rate of exit is less than unity, whether caused by excessive transpiration or by a decrease in root absorption. These 2 processes may be studied by using water culture plants exposed to different environmental conditions or placed in solutions of different osmotic pressures. An experiment is described to illustrate the manner in which changes in the strength of solutions affect the ratio of absorption to transpiration.—A. H. Chivers.

MINERAL NUTRIENTS

2147. HOAGLAND, D. R. Optimum nutrient solutions for plants. Science 52: 562-564. 1920.—The author raises the following questions: (1) Is it probable that the plant has any definite response, within broad limits, to a particular ratio of salts or ions contained in the complete nutrient solution? (2) Assuming the existence of such optimum solutions, are the methods generally employed adequate to determine their composition? It has been shown previously that often the total supply of nutrients may have limited the yield, and also the insolubility of iron, when added in the form of phosphate. In connection with the first point the following experiment may be suggestive: Three nutrient solutions were used with barley; (a) solution used by the author, (b) Shive's best solution, (c) Shive's best solution diluted to $\frac{1}{3}$ of the concentration in (b). Solutions (a) and (b) gave equally favorable growth, while the smaller yield from (c) is not necessarily significant. In this experiment solutions of radically different concentrations and salt proportions have not affected yield of crop to any important extent. Certain solutions may, of course, inhibit plant growth because of unfavorable physiological balance. Nevertheless, the range of equally favorable ratios between nutrient salts is probably a very broad one, no doubt including the solutions of most soils.—A. H. Chivers.

2148. JONES, HENRY WALLACE. The distribution of iron in plant and animal tissues. Biochem. Jour. 14: 654-659. 1920.—Making use in the main of Macallum's haematoxylin method, the writer finds that inorganic iron is quite widely distributed throughout animal and vegetable tissue, the lower organisms giving the reaction much more strongly than the higher. Aquatic animals contain more such iron than terrestrial, and foetal tissues more than adult. All nuclei show the reaction.—A. R. Davis.

2149. MCCALL, A. G., AND J. R. HOAG. The hydrogen-ion concentration of certain three-salt nutrient solutions for plants. Soil Sci. 10: 481-485. Fig. 1. 1920.—Using Gillespie's method of hydrogen-ion determination it was found that in general with any one type of 3-salt nutrient solution the hydrogen-ion concentration is a function of the proportion of KH_2PO_4 present. Types of solutions containing KH_2PO_4 have a lower hydrogen-ion concentration than those containing $\text{Mg}(\text{H}_2\text{PO}_4)_2$ or $\text{Ca}(\text{H}_2\text{PO}_4)_2$. The sulphates and nitrates play

minor parts in determining the reaction of the solutions. The variations in plant growth secured in these solutions cannot be correlated with differences in hydrogen-ion concentration.—*W. J. Robbins.*

2150. TAKE, BR. Die Entwicklung der Wurzeln und der Kalkgehalt des Bodens. [The development of roots and the lime content of the soil.] *Fühling's Landw. Zeitg.* 69: 58-59. 1920.—This note calls attention to the fact that investigations on the subject discussed by OSWALD in his article "Untersuchungen über die Einwirkung des Grundwasserstandes auf die Bewurzelung von Wiesenpflanzen auf Moorböden" published in this journal in 1919 (see Bot. Absts. 7, Entry 638) had been carried on some 20 years ago at the Moor Experiment Station at Bremen, the last mentioned results showing that root penetration is limited by the depth to which the soil is free of acidity.—*A. T. Wiancko.*

PHOTOSYNTHESIS

2151. MAZÉ, P. Recherches sur l'assimilation du gaz carbonique par les plantes vertes. [Investigations on the assimilation of carbon dioxide by green plants.] *Compt. Rend. Acad. Sci. Paris* 171: 1391-1393. 1920.—This is an attempt to give an experimental basis to the hypothesis of Bayer and Berthelot regarding the steps in the synthesis of sugar. Reactions were secured for the following substances in leaves during assimilation: acetylmethylcarbinol, hydrocyanic acid, glycolic aldehyde, and lactic aldehyde.—*Mrs. W. K. Farr.*

2152. WURMSER, RENÉ, ET MME. J. DUCLAU. Sur la photosynthèse chez les algues Floridées. [On the photosynthesis in red algae.] *Compt. Rend. Acad. Sci. Paris* 171: 1231-1233. 1920.—*Chondrus crispus* and *Rhodomenia palmata* were studied in a comparison of the rate of photosynthesis in green and red specimens of the same species. It was found that the red individuals are photosynthetically more active with a given amount of light. An analysis shows that the red individuals contain more chlorophyll than the green, while the lipochromes (xanthophyll and carotin) are present in about equal amounts.—*C. H. Farr.*

METABOLISM (GENERAL)

2153. ANONYMOUS. [Rev. of: ONSLOW, M. W. *Practical plant biochemistry.* iii + 178 p. Cambridge Univ. Press: Cambridge 1920 (see Bot. Absts. 8, Entry 602).] *Sci. Prog.* [London] 15: 498-499. 1921.

2154. ANONYMOUS. [Rev. of: RIDEAL, S., AND ASSOCIATES. *The carbohydrates and alcohol.* xv + 216 p., 11 fig. Baillière, Tindall & Cox: London, 1920.] *Sci. Prog.* [London] 15: 493-494. 1921.

2155. BAKER, J. L., AND H. F. E. HALTON. The iodimetric estimation of sugars. *Biochem. Jour.* 14: 754-756. 1920.—In general, the writers concur with JUDD (see Bot. Absts. 7, Entry 1312) in her favorable report of the WILSTÄTTER and SCHÜDEL iodimetric sugar method and suggest certain modifications in technique.—*A. R. Davis.*

2156. COURTONNE, H. De l'action contraire des chlorures et des sulfates solubles sur le matières amylacées. [On the opposite action of soluble chlorides and sulphates on starchy substances.] *Compt. Rend. Acad. Sci. Paris* 171: 1168-1170. 1920.—Chlorides change starch into amylopectin at ordinary temperatures and into soluble starch at 115°C. No swelling of starch occurred at 115°C. in a mixture of 65 parts $MgSO_4$, 40 parts of water, and 30 parts of starch.—*C. H. Farr.*

2157. COWARD, KATHERINE HOPE, AND JACK CECIL DRUMMOND. Researches on the fat-soluble accessory substance. IV. Nuts as a source of vitamin A. *Biochem. Jour.* 14: 665-667. 1920.—This investigation concerns a rat-feeding experiment in which Brazil, Barcelona, pea, walnut, almond, and butternuts were supplied as a source of vitamin A. These, although rich in fats, have low vitamin A values. This is additional evidence according to

the authors supporting the theory that vitamin A is formed in green tissues and not, in appreciable quantities at least, in seed and other resting tissues.—*A. R. Davis.*

2158. DELF, E. MARION. The distribution of accessory food factors (vitamines) in plants. *South African Jour. Sci.* 17: 121-125. 1920.—The accessory food factors or vitamins are widely distributed in the plant world and are associated with definite organs in the plant body. Seeds possess the water soluble and anti-neuritic accessory factor, but less abundantly than animal eggs. Green leaves possess both anti-scorbutic and fat-soluble vitamins in considerable amounts; the etiolated leaves of the white "heart" of a cabbage possess anti-scorbutic but no growth promoting qualities. Storage organs other than seeds contain chiefly the anti-scorbutic accessory factor. Succulent fruits contain the anti-scorbutic vitamin even before ripening is complete, and germinating seeds have considerable anti-scorbutic value even before the appearance of green leaves. Vitamins may thus be produced either in connection with photosynthesis or in connection with the deposition of reserves.—*E. M. Doidge.*

2159. DRUMMOND, JACK CECIL, AND KATHERINE HOPE COWARD. Researches on the fat-soluble-accessory substance. V. The nutritive value of animal and vegetable oils and fats considered in relation to their colour. *Biochem. Jour.* 14: 668-677. 1920.—The writers conclude that unless the existence of a leuco form is assumed, it does not appear probable that the fat-soluble vitamin belongs to the lipochrome pigment group, and the frequently observed association of the growth factor with such pigments must be regarded as accidental. As a class, animal fats possess greater growth-activating power than vegetable oils; but exceptions exist, and no hard and fast line can be drawn.—*A. R. Davis.*

2160. DRUMMOND, JACK CECIL, AND KATHERINE HOPE COWARD. Researches on the fat-soluble accessory factor (vitamin A). VI. Effect of heat and oxygen on the nutritive value of butter. *Biochem. Jour.* 14: 734-739. *Fig. 1-3.* 1920.—The results obtained are in accord with those reported by Hopkins (see *Bot. Absts.* 8, Entry 2191).—*A. R. Davis.*

2161. SCHERTZ, F. M. A chemical analysis of Sudan grass seed. *Bot. Gaz.* 69: 72-82. *1 fig.* 1920.—This paper reports an analysis of unhulled dry seeds, seeds after germination, and a microchemical analysis of the different parts of the seed. The results are given in tables, and comparison is made with analyses of other economic grasses.—*H. C. Cowles.*

2162. STEPHENSON, MARJORY. A note on the determination of the yellow plant pigments from the fat-soluble vitamin. *Biochem. Jour.* 14: 715-720. 1920.

2163. WAKEMAN, NELLIE A. Pigments of flowering plants. *Trans. Wisconsin Acad.* 19: 767-912. 1919 [1920].—The introductory chapter treats briefly of the theories of color in organic compounds, approaching them from the general point of view of absorption spectra. This is followed by an arrangement of the best known plant pigments according to a rational scheme of classification, that is, according to the degree of saturation based upon the underlying hydrocarbon. By means of this arrangement certain relationships, not otherwise easily observable, are emphasized, namely: (1) The influence of unsaturation in the molecule upon the production of color, (2) the influence of so-called chromophorous groups, (3) the existence of homologous series of plant pigments, and (4) the existence of series of pigments related to similar symmetrical, or almost symmetrical, hydrocarbons of different degrees of saturation.—*Nellie A. Wakeman.*

2164. WILLAMAN, J. J. Carbohydrate economy of cacti. [Rev. of: SPOEHR, H. A. The carbohydrate economy of the cacti. *Carnegie Inst. Washington Publ.* 287. 79 p. 1919 (see *Bot. Absts.* 3, Entry 1744).] *Bot. Gaz.* 69: 91-92. 1920.—This contribution is regarded as containing the most complete analysis of the carbohydrates of a single plant tissue that has been obtained.—*H. C. Cowles.*

2165. WILLAMAN, J. J. **Plant mucilage.** [Rev. of: LLOYD, F. E. **Origin and nature of the mucilage in the cacti and in certain other plants.** Amer. Jour. Bot. 6: 156-166. 1919 (see Bot. Absts. 3, Entry 442).] Bot. Gaz. 69: 96. 1920.

2166. ZILVA, SYLVESTER SOLOMON. **The action of ozone on the fat-soluble factor in fats.** Biochem. Jour. 14: 740-741. 1920.—The results show that ozone produces a more destructive effect upon the fat-soluble factors than was true with the aeration experiments of DRUMMOND and COWARD (see Bot. Absts. 8, Entry 2160) and HOPKINS (see Bot. Absts. 8, Entry 2191).—A. R. Davis.

METABOLISM (NITROGEN RELATIONS)

2167. BLUNCK, GUSTAR. **Die Anpassung der Knöllchen-Bakterien an Nichtleguminosen.** [The adaptation of nodule bacteria to non-leguminous plants.] Centralbl. Bakt. II Abt. 51: 87-90. 1920.—This is a preliminary report. The bacteria must first be adapted to overcome the external mechanical hindrances as well as the inhibiting ferments encountered after entering the plants. The bacteria were first grown on boiled root extract, or root-extract gelatine, the concentration of the extract being gradually increased. After adaptation to the root extract the organisms are grown on dead roots, but must still adapt themselves to the protective plant enzymes by increasing their own antibodies. Active root extract is prepared by grinding the clean, macerated plant roots into a paste by means of quartz sand. The extract is filtered through a Berkefeld filter into sterile containers. This extract is used in increasing amounts with gelatine as with the boiled extract. The medium is sterilized at 50°C. for 1 hour on each of 8 days. When gradually adapted to the activated, organized medium the bacteria are inoculated into living plants. The plants are brought into a state of hunger by culturing in quartz sand and watering with distilled water. The sap flow is lessened by diminishing heat and light.—Anthony Berg.

2168. BUCKNER, G. D., A. M. PETER, AND E. J. KENNEY. **The concentration of sodium nitrate tolerated by tobacco plants.** Soil Sci. 10: 487-491. 1920.—Wilted or unwilted tobacco plants about 10 inches long were placed in tap water containing varying quantities of NaNO_3 . Solutions containing more than 1 part of NaNO_3 to 3750 parts of tap water cause wilting. Concentrations of 150 parts of NaNO_3 to 3750 parts of tap water cause wilting which is more or less permanent. Solutions containing 2-3 parts of NaNO_3 to 3750 parts of tap water give the best general development.—W. J. Robbins.

2169. FEARON, WILLIAM ROBERT. **A study of some bio-chemical tests. No. 2. The Ad-amkiewicz protein reaction. The mechanism of the Hopkins Cole test for tryptophane. A new color test for glyoxylic acid.** Biochem. Jour. 14: 548-564. 1920.

2170. GERICKE, W. F. **On the protein content of wheat.** Science 52: 446. 1920.—Wheat of the Pacific coast states is conspicuously low in protein, due, it is commonly believed, to peculiar influences of climate. The author has investigated the effect of applications of NaNO_3 and $(\text{NH}_4)_2\text{SO}_4$ to plants at different growth periods. Glazed stone jars were filled with a soil low in nitrogen and planted with a pure strain of White Australian wheat. There were added 250 mg. of nitrogen per jar, that is, at the rate of 100 pounds per acre to different jars at different times during the growing period of the plants. A table shows a decided increase (about 77 per cent) in the protein content of wheat obtained from plants receiving nitrogen when 110 days old, over those treated with nitrogen at the time of planting. For each of the different applications of nitrate made after the time of planting there was a corresponding increase in the protein content of the wheat. It is concluded that the low protein content of Pacific Coast wheat is not due primarily to the climate, but to insufficiency of available nitrogen at certain growth periods of the plant.—A. H. Chivers.

2171. NOLTE, O. **Düngungsversuche mit Harn. Über Reizwirkung von Kupfer- u. Quecksilberverbindungen.** [Fertilizer tests with urine with special reference to the stimulating effect

of compounds of copper and mercury.] Fühling's Landw. Zeitg. 69: 141-144. 1920.—This is a report of progress in an investigation of the effect of additions of copper and a combination of copper and mercury to urine upon the growth of mustard. A substantial increase is found in the efficiency of the urine with the addition indicated over the untreated urine.—A. T. Wiancko.

2172. SCHMIDT, ERNST WILLY. Notiz über das Vorkommen von Volutin bei *Azotobacter chroococcum*. [Notes on the occurrence of volutin in *Azotobacter chroococcum*.] Centralbl. Bakt. II Abt. 50: 44-45. 1920.—The author confirms the former work of FISCHER that volutin occurs in the older cells of *Azotobacter chroococcum* and refutes the work of PRAZMOWSKI, which did not confirm Fischer's results.—Anthony Berg.

2173. WANN, FRANK B. The fixation of free nitrogen by green plants. Amer. Jour. Bot. 8: 1-29. 1 pl., 1 fig. 1921.—Seven species of Chlorophyceae were grown in pure cultures on mineral nutrient agar for periods of from 165 to 297 days. Nitrogen was supplied in the form of nitrates in some cases and in the form of urea, glycocoll, asparagine, and ammonium sulphate in others. Some cultures were supplied with glucose and others were not. Analyses for total nitrogen in the culture media were made at the end of the experiment.—When nitrates were used as a source of nitrogen, and when glucose was also present, all the species showed ability to fix the free nitrogen of the atmosphere, the amounts of fixation representing increases in the total nitrogen content of the culture flasks of from 4 to 54 per cent. A comparison of these results with those reported by other workers for legume bacteria and *Azotobacter* shows that the algae fix fully as much nitrogen per unit volume of medium as do these bacteria.—Five species were grown in the presence of nitrates but without glucose. A very slight increase in the nitrogen content was found in these cases, and the author believes that some fixation took place here. He suggests that the very poor growth made in such cultures may explain the small amount of fixation.—When nitrogenous compounds other than nitrates were supplied as a source of nitrogen, no fixation whatever was obtained, either in the presence or absence of glucose. One case of apparent denitrification is reported.—E. W. Sinnott.

2174. WHITING, ALBERT L., AND WARREN R. SCHOONOVER. Nitrogen fixation by cow-peas and nodule bacteria. Soil Sci. 10: 411-420. 1920.—Analyses were made of inoculated and uninoculated cowpeas planted in nitrogen-free sand and furnished with nitrogen-free mineral salts and water. A comparison of the nitrogen content of the inoculated plants with that of the seeds or uninoculated plants shows that a marked fixation of nitrogen occurs shortly after the formation of the first true leaf. This in 3 experiments was 19 days after planting. The first appearance of nitrogen fixation was 9 days after planting. At the end of 26 days after planting the nitrogen fixed was 3 times that contained in the original seed. Tests with diphenylamine and brucine, with α -naphthylamine sulphanilic acid, and with Nessler's solution failed to show nitrate, nitrite, or ammonia in the inoculated seedlings. Inorganic nitrogen of these forms is not concerned in symbiotic fixation by legumes and nodule bacteria.—W. J. Robbins.

METABOLISM (ENZYMES, FERMENTATION)

2175. BOKORNY, TH. Hefeernährung und Gärung. Gibt es eine Hefeentwicklung ohne Zuckervergärung? [Yeast nutrition and fermentation. Can growth of yeast take place without fermentation of sugar?] Centralbl. Bakt. II Abt. 50: 23-33. 1920.—The rôle of alcoholic fermentation in the life of the yeast plant is discussed. Alcoholic fermentation is not essential, and the yeast plant can grow in the absence of fermentable sugar; fermentation occurs, however, whenever possible, and serves to render the medium unsuitable for the development of competing microorganisms.—M. A. Raines.

2176. BORKOWSKI, R. Beitrag zur Kenntnis des Oxydations-vermögens der Wurzeln der höheren Pflanzen. [The oxidizing powers of the roots of higher plants.] Landw. Versuchssta.

94: 265-284. 1919.—Experiments on various species of plants with .05 and .01 per cent solutions of ammonium-ferrosulphate showed that the roots possess considerable powers of oxidizing the iron. It was found that the oxidizing ability is localized in the regions of the root hairs and at the growing tips. Within the root tissues, the separation of iron takes place in the central cylinder and especially in the wood bundles on the inner walls of the vessels and in the adjoining hadrome parenchyma cells; also in the interior of the tissues of the root tip. Considerable differences were found in the oxidizing ability of the different plants tested, according to the extent of their root systems. The weakest in this respect was *Sinapis* and the highest *Phaseolus*, with *Triticum*, *Cannabis*, *Lupinus*, and *Pisum* ranging between, in the order named. *Triticum*, and to a certain extent *Sinapis* and *Cannabis*, showed their highest oxidizing ability in the earlier stages of growth, while *Phaseolus*, *Pisum*, and *Lupinus* showed their greatest oxidizing ability in the later stages of growth. The oxidizing capacity of roots is related in a practical way to the oxidation processes in the soil.—A. T. Wiancko.

2177. KOPELOFF, NICHOLAS. The prevention of sugar deterioration by the use of superheated steam in centrifugals. Louisiana Planter and Sugar Manufacturer 65: 189-190. Fig. 1. 1920.—By using superheated steam in the centrifugals to wash the sugar, 92-99.5 per cent of the bacteria and mold spores are killed. This improves the keeping quality of both the sugar and the molasses.—C. W. Edgerton.

2178. LAUPPER, G. Die neuesten Ergebnisse der Heubrandesforschung. [Results of recent investigations on the heating of hay.] Landw. Jahrb. Schweiz 1920: 1-54. Fig. 1-5. 1920.—This gives a detailed account of the physiological changes occurring in the heating of hay in the stack. Citations (65) of the literature are appended.—J. D. Luckett.

2179. McDOWALL, R. J. S. A review of recent work on enzyme action. Sci. Prog. [London] 15: 406-434. 1921.—A review of the more recent literature dealing with the nature and action of enzymes is given. The work done in the various phases of this subject is correlated, and from the indications of recent work there are pointed out the lines along which solutions of many of the problems may be found.—J. L. Weimer.

2180. ONSLOW, MURIEL WHELDAL. Oxydizing enzymes. II. The nature of the enzymes associated with certain direct oxidizing systems in plants. Biochem. Jour. 14: 535-540. 1920.—This paper deals with the relation of a substance with catechol grouping to the oxidase system. Solutions of various substances having this grouping, such as catechol, caffeic acid, protocatechuic acid, adrenaline, etc., were found to oxidize slowly in air with the formation of peroxides. A solution of peroxidase added to such peroxides completes an oxidase system, which will blue guaiacum. The autoxidation noted above as concerns catechol, protocatechuic acid, and caffeic acid is accelerated by enzyme extracts of plants which turn brown on injury and the juices of which blue guaiacum without the addition of H_2O_2 . In a previous communication, such plants were shown to contain a compound with the "catechol" grouping and the writer suggests here that they may contain, in addition, a second enzyme, for which she tentatively adopts Bach and Chodat's term, "oxygenase." The function of the latter is to catalyse the autoxidation of the catechol compound with the formation of a peroxide. In the case under discussion, 3 components are considered as making up the oxidase system,—a catechol compound from which a peroxide can be formed, and 2 enzymes, an oxygenase which catalyses the production of a peroxide, and a peroxidase which decomposes the peroxide with the formation of active oxygen. All 3 components are necessary for the bluing of guaiacum.—A. R. Davis.

2181. ONSLOW, MURIEL WHELDAL. Oxidizing enzymes. III. The oxidizing enzymes of some common fruits. Biochem. Jour. 14: 541-547. 1920.—Enzyme action in plant tissue may be difficult of demonstration due to the presence of certain inhibitors as well as to faulty technique. Best results are usually obtained when the tissue is placed directly in the reagent. When tissue extracts are employed action may be modified by (1) failure to extract the enzyme

and (2) the relative concentration of enzymes, sugars, organic acids, and tannins in extracts being different from that existing *in situ*. If inhibitors are present, they must be removed. The following technique was employed by the author: (a) *Reaction of tissues*. Pieces of tissue were placed directly in the reagents,—alcoholic solution of guaiacum, 1 per cent solution benzidine in 50 per cent alcohol with H_2O_2 , 1 per cent α -naphthol in 50 per cent alcohol with H_2O_2 . (b) *Reaction of water extract*. Water extract of pounded tissue was tested in above reagents, and if acid it was neutralized to litmus. (c) *Reaction with extracts of enzymes*. Sugars, tannins, etc., were extracted from pounded tissue with 96 per cent alcohol and the enzyme extracted from the residue with water. This was tested for peroxidase with guaiacum and H_2O_2 , and for oxygenase with catechol and guaiacum. (d) *Extraction of aromatic compounds and their reaction with enzyme extract*. Employing methods outlined above, the following fruits were tested for oxidizing enzymes: Apple, quince, pear, plum, banana, orange, lemon, lime, and raspberry. The apple, pear, quince, and plum were found to contain an oxidase (peroxidase, oxygenase, and aromatic substance with catechol grouping). Both skin and flesh of banana contained peroxidase and oxygenase; the orange, lemon, and lime contained peroxidase in rind and pulp, but no oxygenase and no substance giving the catechol reaction. Raspberry fruit gave similar results.—A. R. Davis.

METABOLISM (RESPIRATION, AERATION)

2182. BERGMAN, H. F. The effect of cloudiness on the oxygen content of water and its significance in cranberry culture. Amer. Jour. Bot. 8: 50–58. 3 fig. 1921.—A study of the oxygen and CO_2 content of pond and bog water used in flooding cranberry bogs was made in Wisconsin and Massachusetts. In general, it was found that oxygen was more abundant and CO_2 less abundant (1) during the latter part of the day as compared with the morning, and (2) during clear days as contrasted with cloudy ones. Under the following conditions, namely, (1) clear, sandy bottom pond, (2) muck-bottom pond, and (3) discolored water of a bog ditch, there were, in the order given, more oxygen and less CO_2 and much less variation in the content of these 2 gases. It is suggested that the photosynthesis and respiration of plants and the oxidation of organic matter are responsible for the amount of these gases present and that differences in light intensity, amount of vegetation, and amount of organic matter produce the differences observed. Experiments are cited in which cranberry plants, submerged in tubs of either pond or ditch water, were injured by shading, while unshaded plants under otherwise similar conditions were not injured. The oxygen content in the unshaded tubs was much reduced. Respiration (and thus the need of oxygen) was found to be much more rapid in flowers and growing tips of cranberry plants than in old shoots. The injury to growing tips which frequently follows flooding the bogs is thought to be due to deficiency of oxygen in the water. Such injuries are more likely to occur if water full of organic matter is used or if flooding is done in cloudy weather.—E. W. Sinnott.

2183. PIÉDALLU, ANDRÉ, PHILIPPE MALVEZIN, ET LUCIEN GRANDCHAMP. Action de l'oxygène sur les moûts de raisins rouges. [The effect of oxygen on the wine from red grapes.] Compt. Rend. Acad. Sci. Paris 171: 1230–1231. 1920.—Oxygen is found to change the color of the solution to a white or a rose if allowed to diffuse through a porous plate, thus no decolorizing chemicals are necessary.—C. H. Farr.

ORGANISM AS A WHOLE

2184. LIESEGANG, RAPHAEL ED. Gegenseitige Wachstumshemmung bei Pilzkulturen. [Mutual antagonism in fungus cultures.] Centralbl. Bakt. II Abt. 51: 85–86. Fig. 1. 1920.—The author attributes the gaps that appear between approaching colonies in the well-known phenomenon of "growth antagonism," to a deficiency of an essential nutrient. This nutrient, which must be essential for both approaching colonies, has diffused in the direction of the growing colonies and no longer exists in sufficient amount to sustain growth. The author has reproduced an analogous phenomenon by using silver nitrate gelatine upon which drops of sodium chloride are placed.—Anthony Berg.

2185. PRINGSHEIM, E. G. Über die gegenseitige Schädigung und Förderung von Bakterien. [The mutual injury and stimulus between bacteria.] Centralbl. Bakt. II Abt. 51: 72-85. 1920.—Methods are suggested for the study of the effects of 2 cultures of bacteria growing together. *Bacillus mesentericus vulgatus* on the same plate with *B. diphtheriae* inhibits the growth of the latter, so that even 8-10 colonies of the former will repress entirely the growth of *B. diphtheriae*. In addition to the injurious action *B. mesentericus vulgatus* also exerts a stimulating action on *B. diphtheriae* as indicated by the formation of giant colonies of *B. diphtheriae* in the zone of influence of the former. The substance produced by *B. mesentericus vulgatus* is a thermolabile poison which stimulates in small doses and injures in large ones. Other spore formers of the hay bacillus group, 8 of which were tested, did not exert the same antagonistic action. *B. coli* and *B. paratyphosus* A were not affected by *B. mesentericus vulgatus*. The action of various bacteria on *B. influenzae*, on the gonococcus, and on certain anaerobes was also studied.—Anthony Berg.

2186. ROCKWELL, G. E., AND C. F. MCKHANN. The growth of the gonococcus in various gaseous environments. Jour. Infect. Diseases 28: 249-258. 1921.—This is a study of the growth of *Gonococcus* under the influence of hydrogen, oxygen, and carbon dioxide. It is suggested that the fact that bacteria are aerobic, partial tension, anaerobic, or facultative in their respiratory requirements is an expression of their previous gaseous adaptation.—Selman A. Waksman.

GROWTH, DEVELOPMENT, REPRODUCTION

2187. CROCKER, WILLIAM. Germination. [Rev. of: RUSSELL, G. A. Effect of removing the pulp from camphor seed on germination and the subsequent growth of the seedling. Jour. Agric. Res. 17: 223-238. 1919 (see Bot. Absts. 3, Entry 2900).] Bot. Gaz. 69: 96. 1920.

2188. GOERTZ, OTTO. Untersuchungen über die Haustorienbildung bei *Cuscuta*. [Studies on haustorium formation in *Cuscuta*.] Centralbl. Bakt. II Abt. 51: 287-313. 1920.—Experiments are described checking and extending our knowledge of the irritability factors involved in the production of haustoria by *Cuscuta*. The form worked with was *C. Gronovii* Willd., an American species found parasitizing *Impatiens parviflora* DC. in the botanic garden at Leipzig. Haustoria can be produced on any aspect of the surface of the shoot, although the inner or concave side seems to exhibit a higher predisposition in this respect; production of haustoria on the convex or outer face of the stem was induced by allowing the latter to twine within a glass tube. The dodder shoot must be actively growing. Mere contact with a solid body, without a certain amount of pressure, is not sufficient to cause the production of haustoria, as was indicated by attaching sand grains to the shoot by means of paraffine oil. No haustoria are produced after flowering begins. Both twining and haustorium production are inhibited on the klinostat. Contact with liquids will not induce haustorium production though submerged plants may produce haustoria. A dodder plant lived 14 days under water twining around and parasitizing a shoot of *Myriophyllum*. Exposure to radium emanations inhibited all growth activity.—M. A. Raines.

2189. KRAUS, E. J. The modification of vegetative and reproductive functions under some varying conditions of metabolism. Amer. Jour. Bot. 7: 409-416. 1920.—The author discusses certain factors which tend to cause a development of vegetative organs in the plant and others which stimulate reproduction. The early idea that the 2 functions are antagonistic and that nitrogen stimulates only the former and potash and phosphorus the latter is now recognized as incomplete. These 2 functions now seem instead to depend upon the relationship between available nitrogen and the plant's supply of carbohydrates. If the former is abundant and the latter scanty (as in plants with reduced leaf surface or growing in poor light) the result is a plant vegetatively weak and with few or no reproductive organs. If both nitrogen and carbohydrates are abundant, however, there is vigorous vegetative development but little sexual reproduction. If nitrogen is limited in relation to carbohydrates, the latter will not

all be used in vegetative extension and can accumulate, with the result that the plant is vigorous and fruitful. Finally, if nitrogen is still further reduced, carbohydrate reserves accumulate in abundance but the plant is weak vegetatively and reproduces but little. The rôle of other chemical elements and of water, light, temperature, and hereditary factors in this problem are also doubtless important and should be thoroughly studied. The author points out the importance in such a problem as this of obtaining a large body of chemical analyses of the plants to be studied, made upon the various tissues and organs and at successive intervals during the year.—*E. W. Sinnott.*

TEMPERATURE RELATIONS

2190. GERICKE, W. F. Influence of temperature on the relations between nutrient salt proportions and the early growth of wheat. *Amer. Jour. Bot.* 8: 59-62. 1921.—Wheat seedlings were grown in the 126 3-salt solutions described by the committee on salt requirements, and at 2 different temperatures, 28°C. (approximately the optimum) and 17°C. (considerably below the optimum). It was found that the best growth at the lower temperature was produced when the proportion of potassium was high and of H_2PO_4 low; and at the high temperature when the proportion of potassium was low and of H_2PO_4 high. Temperature is thus important as a factor in determining what are the mineral requirements for good germination and initial growth in wheat.—*E. W. Sinnott.*

2191. HOPKINS, FREDERICK GOWLAND. The effects of heat and aeration upon the fat-soluble vitamine. *Biochem. Jour.* 14: 725-733. *Fig. 1-4.* 1920.—The experiments conducted show that although fat-soluble A of butter displays considerable resistance to heat alone at temperatures up to 120°C., it is readily destroyed by simultaneous aeration of the fat.—*A. R. Davis.*

2192. JÖRGENSEN, I., AND WALTER STILES. Some scientific aspects of cold storage. *Sci. Prog.* [London] 13: 614-620. 1919.—The authors outline some of the problems involved in studying the cold storage of foods. Some changes which take place in stored fruits are discussed.—*J. L. Weimer.*

2193. WINGE, Ö. A practical form of thermostat aquaria heated by electricity. *Compt. Rend. Trav. Carlsberg Lab.* [København] 14¹⁰: 1-4. 1920.—This form of thermostat aquarium has been in successful use at this laboratory for several years and has been of value in giving aquatic organisms homogeneous conditions and in studying the effect of different degrees of temperature on their activity. Heating units are placed underneath the tank and these are insulated from the air. A mercury contact thermo-regulator operates a switch in the heating circuit by means of a relay. The essential feature of this switch is a sealed glass tube containing 2 drops of mercury connected electrically by the armature of the relay which floats upon them; when the armature is raised contact is broken. An automatically operating air chamber for ventilation is provided.—*F. Weiss.*

2194. ZIKES, HEINRICH. Über den Einfluss der Temperatur auf verschiedene Functionen der Hefe. [The influence of temperature on various functions of yeasts.] *Centraltbl. Bakt.* II Abt. 50: 385-410. *Fig. 5.* 1920.—The budding activity of yeasts is more or less dependent on those temperatures at which it was previously grown and to which it has adapted itself. "Cold" yeasts, that is, yeasts formerly grown at low temperatures, show a much more rapid growth (likewise more rapid ascospore formation) at all low temperatures than do cells of the same species grown at a higher temperature, and conversely. Some yeasts are more irritable in this respect than others. Cold yeasts adapt themselves more easily to higher temperatures than high temperature yeasts to lower temperatures. The formation of fat (in the fat granules) takes place very slowly at low temperatures (12-15°C.) and more rapidly at high temperatures (20-30°C.). A secondary development of small fat globules occurs very abundantly at low temperatures. *Mycoderma cerevisiae* is a weak glycogen former; likewise *Torula alba* and *Willa Anomaia*. In *Chalara mycoderma* variations in temperature

seem to have little influence on the formation of glycogen. The optimum for the formation of glycogen in brewer's yeast is around 30°C. Cells kept at high temperatures for some time and then forced to adapt themselves to low temperatures showed a very low rate of propagation (20-30 cells in 3 days) while yeasts of the same species grown at high temperatures for some time produced 300,000-350,000 cells in the same period. The formation of esters is slower at lower temperatures (10°C.) than at higher temperatures (30°C.). The shape of the cells is influenced by variations in temperature; the former shapes being assumed, however, when subsequently grown at optimum temperatures. In pigment producers the production of coloring matter is most pronounced at low temperatures. Giant colonies show only gradual changes with variations in temperature, but are raised above the substratum much more when grown at low temperatures. Softening and liquefaction of yeasts takes place more rapidly as the temperature increases. In determinations of the thermal death point *Willa saturnus*, *Schizosaccharomyces Pombe*, *Saccharomyces Logos*, and *Saccharomyces thermantilonum* were found more resistant.—Anthony Berg.

RADIANT ENERGY RELATIONS

2195. RUSS, SIDNEY. Growth and division of cells as affected by radiation. Sci. Prog. [London] 13: 605-613. 1919.—This is a discussion of the effect of x-rays on the growth of tumors, with special reference to the susceptibility of the cells in different stages of growth to radiation.—J. L. Weimer.

TOXIC AGENTS

2196. HARDEN, ARTHUR, AND FRANCIS ROBERT HENLY. The effect of pyruvates, aldehydes, and methylene blue on the fermentation of glucose by yeast juice and zym in presence of phosphate. Biochem. Jour. 14: 642-653. Fig. 1-2. 1920.—The investigators take as a thesis the fact noted by various workers that α -ketoacids and aldehydes have an activating effect upon yeast fermentation, particularly at the commencement of the reaction, and that this effect has been noted especially in experiments made with maceration extract containing a large amount of mineral phosphate. The question arose as to whether this was a general stimulation effect or a more specialized acceleration of the reaction in the presence of free mineral phosphate. In general, the results show no marked activation following the addition of aldehydes to fermenting mixtures of yeast juice or zym in with glucose. If a suitable amount of phosphate be added, the effect of the aldehyde is to greatly diminish the time required for the maximum gas production, and likewise a higher maximum is attained. On completion of the esterification of the phosphate, the rate again diminishes both in the presence and absence of aldehyde and the total evolution is not greatly different in the 2 cases. Similar effects were obtained with pyruvates. The effect varies with the concentration of the aldehyde and is common to, but not equal in, the 4 aldehydes tested, formic, acetic, propionic, and butyric. The results suggested an effect due to a lack of an acceptor for hydrogen. Methylene blue, readily reducible by hydrogen, produced the same effects as the aldehydes. In the light of these results, the final stage of alcoholic fermentation of sugar is held to be the reduction of the acetaldehyde produced by the decomposition of pyruvic acid, the production of this latter from sugar being only possible when some acceptor for hydrogen is available. This acceptor is normally supplied by acetaldehyde produced at a later stage of the reaction.—A. R. Davis.

2197. WILLAMAN, J. J. Toxicity of alpha-crotonic acid. [Rev. of: SKINNER, J. J., AND F. R. REED. The influence of phosphates on the action of alpha-crotonic acid on plants. Amer. Jour. Bot. 6: 167-180. 1919 (see Bot. Absts. 3, Entry 437).] Bot. Gaz. 69: 96. 1920.

MISCELLANEOUS

2198. CARLES, PIERRE. Sur la casse bleue des vins. [The "blue cassia" of wine.] Compt. Rend. Acad. Sci. Paris 169: 1422-1423. 1919.—The treatment of this so-called "disease" of wine by the addition of an organic acid, either tartaric or citric, is recommended.—R. W. Webb.

trichum commune L. [Spore dissemination in *Polytrichum commune* artificially induced.] *Hedwigia* 60: 350-351. 1919.—If mature capsules of *Polytrichum commune*, deprived of their opercula, are immersed in ether, the spores are set free through the minute openings between the peristome and the epiphragm. The ether dissolves the layer of wax on the outside of the spore-case, and this is followed by a contraction of the internal parts of the capsule. The extrusion of the spores, which is at first violent and accompanied by a distinct crackling sound, gradually slows down.—A. W. Evans.

2200. PIÉDALLU, ANDRÉ. Sur le rôle du fer dans la casse bleue des vins. [The rôle of iron in "blue cassia" of wine.] *Compt. Rend. Acad. Sci. Paris* 169: 1108-1109. 1919.—The term "casse bleue" is applied to a "disease" of wine, and the author finds that this frequently appears in wine that has been previously transported in wagon-casks made of iron. Among the phenomena accompanying this disease are the deposition of the coloring matter of the wine on the sides and bottom of the containing vessels and the appearance of an iridescent veil on the surface. The indications are that the "disease" is induced by the presence of ferric salts. Control methods are suggested.—R. W. Webb.

2201. VAN ALSTINE, ERNEST. The determination of hydrogen-ion concentration by the colorimetric method and an apparatus for rapid and accurate work. *Soil Sci.* 10: 467-479. *Pl.* 1, fig. 1-2. 1920.—A colorimeter is described consisting of an eyepiece and wooden blocks holding the standard tubes and the unknown solutions which slide before it. The blocks holding the tubes may have 1, 2, or 3 series of holes and tubes, depending upon whether single tube standards, double tube standards, or double tube standards and turbid solutions are used. A graph and table prepared by calculation are given which permit the preparation of double tube standards having any desired P_H between 2 and 10.—W. J. Robbins.

SOIL SCIENCE

J. J. SKINNER, *Editor*

F. M. SCHERTZ, *Assistant Editor*

(See also in this issue Entries 1584, 1585, 1586, 1589, 1607, 1614, 1624, 1816, 1958, 1963, 1977, 2150, 2174, 2176, 2190)

2202. ANONYMOUS. [Rev. of: COLLINS, S. H. *Chemical fertilizers and parasiticides*. xii + 273 p., 8 fig. Ballière, Tindall & Cox: London, 1920.] *Sci. Prog.* [London] 15: 494-495. 1921.

2203. ANTONIADIS ET MAUME. Essais avec la cyanamide de calcium. [Experiments with calcium cyanamid.] *Ann. École Nation. Agric. Montpellier* 17: 120-130. *Fig. 1.* 1918 [1919].—Pot culture experiments showed that calcium cyanamid is clearly toxic when incorporated in the soil at the time the grain is sown. When incorporated some time before the seed is sown (at least 15 days) calcium cyanamid loses its toxicity, but the seedlings are inferior to those grown in control plots. A study of the effect of calcium cyanamid on different types of soils is contemplated.—F. F. Halma.

2204. BAGULEY, A. Building up the fertility of the soil. *Jour. Dept. Agric. Union of South Africa* 1: 755-759. 1920.—Improving the productivity of soil by supplying humus, lime, nitrogen, potash and phosphoric acid is discussed and also the common chemicals used in commercial fertilizers.—Lyman Carrier.

2205. BIPPART, E. Zum Wasserhaushalt des Bodens. [Water relations of soils.] *Mitteil. Deutsch. Landw. Ges.* 35: 330-331. 1920.

2206. CROCKER, WILLIAM. Heated soils. [Rev. of: JOHNSON, JAMES. *The influence of heated soils on seed germination and plant growth*. *Soil Sci.* 7: 1-87. 1919 (see Bot. Absts.)

3, Entry 854).] *Bot. Gaz.* 69: 94-95. 1920.—This is regarded as “a very critical and exhaustive piece of work.” The “results are valuable in elucidating the effects of sterilizing soils by heat.”—*H. C. Cowles.*

2207. DACKNOWSKI, ALFRED P. Peat deposits in the United States and their classification. *Soil Sci.* 10: 453-465. 1920.—A review of literature dealing with the extent and systems of classifying peat deposits.—*W. J. Robbins.*

2208. FRAPS, G. S. Composition of the soils of Archer, Franklin and Harris counties. *Texas Agric. Exp. Sta. Bull.* 244. 78 p. 1919.—The area of each soil type occurring in the 3 counties is given together with the amount of plant food each contains. Each soil is described and its needs suggested. The results of pot experiments on the various soils are given and methods of maintaining soil fertility discussed.—*L. Pace.*

2209. FRAPS, G. S. The needs of Texas soils for lime. *Texas Agric. Exp. Sta. Bull.* 243. 18 p. 1919.—A general discussion of the effects of lime in which it is pointed out that lime affects the physical character of the soil, aids in the retention of water, and makes phosphoric acid more available. Experiments are cited which show that it does not render potash more available. Lime aids in making the nitrogen content of the soil more available, resulting in more rapid impoverishment of soils. As a rule, lime should not be used on alkali soils as the carbonates formed are more injurious than the alkali. Sources of lime for agricultural uses are discussed and methods of applying are described.—The distribution of acid soils in Texas is given.—*L. Pace.*

2210. HASENBÄUMER, J. Einfluss der Bodenreaktion auf die Düngung und Fruchtbarkeit der Kulturböden. [Influence of the soil reaction on fertilizing and on the productivity of the soil.] *Mitteil. Deutsch. Landw. Ges.* 36: 80. 1921.—The author calls attention to the damage to plants from an acid soil and suggests the following method for determining the relative acidity of soils. Thirty grams of soil are shaken for 1 hour with 100 cc. 7.5 per cent solution of KCl. To 10 cc. of the filtrate 4-5 drops methyl red are added. After violent shaking the color will be lilac if the reaction is very strongly acid, carmine if strongly acid, cinnabar red if acid, orange if weakly acid, and yellow if neutral or alkaline. In the last case 10 cc. of filtrate should be used with 5 drops of Azolieuim. If the solution becomes pure blue without a trace of violet or red the soil is strongly alkaline.—*A. J. Pieters.*

2211. HERMANN. [Rev. of: LOEW, OSKAR. Ueber die Bedeutung des Kalkes für die Ernährung der Pflanzen, Tiere und Menschen. (The significance of lime in the nourishment of plants, animals, and man.) *Naturwiss. Zeitschr. Forst- u. Landw.* 16: 309. 1918.] *Forst. Rundschau* 20: 27-28. 1919.

2212. JURITZ, CHAS. F. The agricultural soils of the Union. A summary of existing knowledge. *South African Jour. Indust.* 4: 76-84. 1921.

2213. LEACH, B. R. A study of the behavior of carbon disulfide when injected into the soil and its value as a control for the root form of the woolly apple aphid. *Soil Sci.* 10: 421-451. *Pl. 1-2, fig. 1-8.* 1920.—By using buried pieces of roots infected with woolly aphid it was found that the moisture content of the soil limits the effective diffusion of CS₂. It cannot be applied effectively when conditions are favorable for killing the aphid without injuring the roots.—*W. J. Robbins.*

2214. LEMMERMANN, O., UND L. WICHERS. Über den periodischen Einfluss der Jahreszeit auf den Verlauf der Nitrifikation. [Seasonal influence on the rate of nitrification.] *Centralbl. Bakt.* II Abt. 50: 33-43. 1920.—An experiment is described in which parallel analyses for nitrates were made monthly for 12 months of samples of soil from the field, and from a quantity of similar soil kept in the laboratory under constant temperature and moisture conditions. The curves for the 2 series of tests practically coincide, exhibiting maxima in April and July.—*M. A. Raines.*

2215. MARCHAND, B. DE C. Chemical analysis of soils. Jour. Dept. Agric. Union of South Africa 1: 341-348. 1920.—The author annotates in detail the information contained in a "complete soil analysis" and in a partial analysis to determine manurial needs.—*E. M. Doidge*.

2216. MARCHAND, B. DE C. Representative Transvaal soils 1. The Koedoespoort Red Loam. Jour. Dept. Agric. Union of South Africa 1: 722-727. 1920.

2217. MÜNTER, F. Die Zuckerrübe als Boden analysatorim. [The sugar beet as soil analyzer.] Mitteil. Deutsch. Landw. Ges. 35: 313-314. 1920.—The author points out that while a chemical analysis of plants generally does not yield information of value regarding the fertility of the soil, the sugar beet may be used in a limited way to determine whether or not potassium or phosphoric acid is present in the soil in sufficient quantities. From tables of analyses he concludes that if, on soil in which there is ample nitrogen, the percentage of potash in the plant exceeds that of nitrogen, there is sufficient potash in the soil; if it is less, there is not enough for the plants. If, on similar soil, the ratio of nitrogen to phosphoric acid is greater than 100:20, phosphoric acid is needed; if the ratio is less, phosphoric acid is present in sufficient quantity.—*A. J. Pieters*.

2218. SMIT, B. J. Representative Transvaal soils, II. Pretoria quartzite sandy soils. Jour. Dept. Agric. Union of South Africa 2: 170-176. 1921.

2219. STEAD, ARTHUR. The agriculture and soils of the Cape Province, 1. Jour. Dept. Agric. Union of South Africa 1: 152-158. Pl. 1-2, map. 1920.—An account is given of the Witkop district in the Stormburgen, with reference to its climatic conditions, potato and wheat culture, and principal types of soils.—*E. M. Doidge*.

2220. STEAD, ARTHUR. The agriculture and soils of the Cape Province IV. Witkop Burghersdorp. Jour. Dept. Agric. Union of South Africa 1: 660-670. Pl. 6-7. 1920.

2221. STEAD, ARTHUR. The agriculture and soils of the Cape Province V. Witkop-Burghersdorp. Jour. Dept. Agric. Union of South Africa 1: 819-828. Pl. 8-10. 1920.

2222. STEAD, ARTHUR. Brak in its relation to irrigation. Jour. Dept. Agric. Union of South Africa 1: 13-25. Pl. 1-4. 1920.—Where the rainfall is so light that irrigation is necessary the soil contains more or less brak. Directions are given for the irrigation of brak soils, and for the use of brak waters in irrigation. Crops which are deep rooted and which shade the land are best for brak lands because they prevent evaporation at the surface.—*E. M. Doidge*.

2223. THOMPSON, H. C. Experiments with muck soils in growing greenhouse crops. Jour. Amer. Peat Soc. 14: 45-63. 1921.—Lettuce, cauliflower, tomatoes, carnations, and roses were used to test muck as a greenhouse soil. A chemical analysis does not give any indication of the crop-producing capacity of a muck soil.—*G. B. Rigg*.

2224. WEIGNER, GEORG. Boden und Bodenbildung in kolloidchemischer Betrachtung. [Soil and soil formation in the light of colloidal chemistry.] 15 x 22 cm., 98 p., 10 fig. Theodor Steinkopff: Dresden and Leipzig. 1918.—A general treatise on the subject, reviewing the late developments in colloidal chemistry and applying the principles of colloidal chemistry to soil formations.—*J. J. Skinner*.

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 1604, 1655, 1695, 2006, 2009)

GENERAL

2225. BLACK, J. M. Additions to the flora of South Australia. No. 15. Trans. and Proc. Roy. Soc. South Australia 43: 23-44. Pl. 6-8. 1919.—Three species are included which are believed to be new to science. They are described under the names *Kochia Cannonii*, *Pimelea Williamsonii*, and *Goodenia vernicosa*.—J. H. Faull.

2226. BLACK, J. M. Additions to the flora of South Australia. No. 16. Trans. and Proc. Roy. Soc. South Australia 43: 349-354. Pl. 32. 1919.

2227. CHANCEREL, LUCIEN. Flore forestière du globe. [Forest flora of the world.] 16.5 X 25 cm., 738 p. Gauthier-Villars et Cie.: Paris, 1920.—The avowed purpose of this work is to describe, scientifically and practically, the principal trees of the world and to indicate (1) their botanical and sylvan characteristics, (2) their geographical distribution and habitats, (3) their soil preferences, (4) the different races of each species, (5) the characters and properties of their woods, (6) their various products, (7) their cultural uses, and (8) their diseases and their enemies. The commoner or more generally known trees, shrubs, and vines native to all parts of the world are treated according to the above headings with more or less detail.—E. B. Payson.

2228. COULTER, J. M. Flora of District of Columbia. [Rev. of: HITCHCOCK, A. S., and P. C. STANDLEY. Flora of the District of Columbia and vicinity. Contrib. U. S. Nation. Herb. 21: 1-329. 42 pl. 1919 (see Bot. Absts. 4, Entry 1731).] Bot. Gaz. 68: 487. 1919.

2229. COULTER, J. M. New African plants. [Rev. of: MOORE, SPENCER LeM. Alabastra diversa. XXXI. 1. Miscellanea Africana. Jour. Botany 57: 212-219, 244-251. 1919 (see Bot. Absts. 3, Entry 3003; 4, Entry 1748).] Bot. Gaz. 68: 488. 1919.

2230. HOLMBOE, JENS. Den botaniske ekskursjon i Bergens shjargaerd efter det 16 de skandinaviske naturforskermöte 17 de og 18 de juli 1916. [The botanical excursion among islands near Bergen after the 16th meeting of the Scandinavian naturalists July 17-18, 1916. Bergens Mus. Aarbok Naturv. Raekke 1917-1918¹⁶: 31 p. 1920.—The contribution includes: Notes on vascular plants, with list; *Taraxacum schizophyllum* Dahlst., n. sp.; and a list of bryophytes and lichens.—A. Gundersen.

2231. HOUSE, HOMER D. Wild flowers of New York. New York State Mus. Mem. 15. 362 p., 264 quadricolor photo pl., 35 fig. 1918 [1920].—The author has presented a treatment of the wild flowers of New York similar in purpose and scope to Fuertes' "Birds of New York," but while the colored plates of the latter were reproduced from original paintings by Fuertes, in the present memoir all illustrations are from photographs, 35 species being shown in black and white half tone and 364 species in natural colors by the quadricolor process. In this process, from black and white photographs taken in the field, "four plates were made to print respectively yellow, red, blue, and black, the latter to give shade and depth to picture. With a lumiere photograph as guide (this having been taken in the field at same time as black and white photos) the other 3 plates were etched down to print each its respective color in the correct proportion and position. These plates set up in press and printed in sequence, yellow, blue, red, black, in perfect register give the quadricolor process picture." Of the 402 species illustrated, nearly all are herbaceous, there being only a few shrubs (Ericaceae notably) and no trees. Numerous foreign species now run wild in this territory are included. Eighty-

eight families (following Britton and Brown, 2nd ed., are represented, many by only a single species, but of the order Liliales 26 species are shown, of the orchid family 28 (thus reflecting the popular interest in this group), of the buttercup family 22, and of Rosales as a whole 44 species. The genus *Viola* is fully represented by 17 species while of the order Ericales there are 20, of mints 13, of the Scrophulariaceae 17, and of composites in the broad sense 50 species. Descriptive text accompanies the plates and figures, all being printed on uniform medium weight coated paper. Common names are given in dark faced type followed by the scientific name in italics. A paragraph of technical description, another of habitat relations, geographical distribution, flowering data, and frequency. Frequently also data as to related genera or species are given and, in some cases, items of general information or historical interest are added. Keys to more difficult or larger genera are included; as in *Polygala*, *Viola*, and *Aster*. The text and plates are preceded by 23 pages of descriptions of plant structures for the aid of persons not trained in the use of manuals—a sort of illustrated glossary with 95 cuts adapted from Gray's Lessons in Botany.—W. L. Bray.

2232. MOSS, C. E. *The Cambridge British flora*. Vol. 3, *xvi* + 200 p., 191 pl. University Press: Cambridge [England], 1920.—The present volume continues this well known work on the same plan as the previous volumes; it includes the families Portulacaceae to Fumariaceae. Outstanding features of the work are: A very full bibliography and synonymy, outline maps showing the distribution of species, a recognition and differentiation of many varieties, subvarieties, forms, and hybrids, several of which are indicated as new or new combinations.—J. M. Greenman.

2233. RICE, BERTHA M., AND ROLAND RICE. *Popular studies of California wild flowers*. 8 vo., 127 p., 34 illustrations from photographs. Upton Bros. & Delzelle: San Francisco, 1920.—The title of this volume well characterizes the work. The authors have presented in popular more or less poetic style some of the attractive Californian wild flowers.—J. M. Greenman.

2234. STONE, HERBERT. *A guide to the identification of our more useful timbers, being a manual for the use of students of forestry*. 8 vo., *viii* + 52 p., 3 pl. Cambridge University Press: London, 1920.

2235. TAYLOR, NORMAN. [Rev. of: BRITTON, N. L., AND C. F. MILLSPAUGH. *The Bahama Flora*. *viii* + 695 p. Published by the authors: New York, 1920 (see Bot. Absts. 7, Entry 1429).] *Torreya* 20: 124, 125. 1920.

PTERIDOPHYTES

2236. HIERONYMUS, G. *Bemerkungen zur Kenntnis der Gattung Angiopteris Hoffm., nebst Beschreibungen neuer Arten und Varietäten derselben*. [The genus *Angiopteris* with descriptions of new species and varieties.] *Hedwigia* 61: 242-285. 1919.—The following new species from the Orient are described: *Angiopteris Naumannii*, *A. novocaledonica*, *A. papandayanensis*, *A. Cumingii*, *A. Henryi*, *A. elongata*, *A. Oldhami*, *A. boninensis*, *A. palauensis*, *A. Boivini*, *A. Fauriei*, *A. fokiensis*, *A. yunnanensis*, *A. caudatiformis*, *A. Sakuraii*, *A. oschimensis*, and *A. oligotheca*. Several new varieties are included.—D. Reddick.

SPERMATOPHYTES

2237. ALLEN, MARION E. *The supposed generic character of Naumburgia*. *Rhodora* 22: 193-194. 1920.—By some botanists *Lysimachia thyrsiflora* has been separated from *Lysimachia*, as a genus *Naumburgia*, on the ground of the small, tooth-like staminodia in the sinuses of the corolla. A number of dissections of both American and foreign material in the Gray Herbarium showed that the American specimens were consistently characterized by an absence of staminodia, and that they were wanting in a majority of cases in the Eurasian material. Thus *Naumburgia* Moench, as a genus distinct from *Lysimachia*, falls to the ground. The plant with teeth is probably a variation.—James P. Poole.

2238. BAAS BECKING, L. H. *Staphylea colchica* Stev. var. *laxiflora* n. var. Mededeel. Landbouwhoogeschool Wageningen 17: 83-89. Pl. 6-7. 1920.

2239. BLACK, J. M. A revision of the Australian Salicornieae. Trans. and Proc. Roy. Soc. South Australia 43: 355-367. Pl. 33-37. 1919.—Four genera are included in the present revision, namely, *Arthrocnemum*, *Pachycornia*, *Salicornia*, and *Tecticornia*. One new variety, *A. halocnemoides* Nees var. *pergranulatum*, is described; *A. Lylei* (*Salicornia* Ewart & White) and *P. tenuis* (*Salicornia tenuis* Benth.) appear as new combinations.—J. H. Faull.

2240. BRADSHAW, R. V. A new Oregon *Eucephalus*. *Torrey* 20: 122, 123. 1920.—*Eucephalus vialis* n. sp., collected on rocky hillsides at Eugene, Oregon, is described. The species seems nearest to *E. Engelmannii* (Gray) Greene, from which it differs chiefly in the smaller rayless heads, with narrower and more glandular involucre bracts.—J. C. Nelson.

2241. BRANDEGEE, TOWNSHEND STITH. *Plantae Mexicanae Purpusianae*, X. Univ. California Publ. Bot. 7: 325-331. Dec 29, 1920.—The author describes 1 new genus and 18 new species. The new genus is *Pachystelma* (gen. nov. Asclepiadacearum). All new species with one exception are named by the author as follows: *Hechtia glabra*, *H. Purpusii*, *Ocotea pyramidata* Blake, *Bauhinia jucunda*, *Indigofera aconicae*, *Eriosema nigropunctatum*, *Esenbeckia ovata*, *Euphorbia consoquillae*, *Jatropha longepedunculata*, *Ayenia Purpusii*, *Maba Purpusii*, *Sideroxylon campestre*, *Dictyanthus prostratus*, *Polystemma rupestre*, *Pachystelma cordatum*, *Cynanchum racemosum*, *Solanum molestum*, and *Viguiera pauciflora*.—W. A. Setchell.

2242. CHEEL, EDWIN. Notes on three species of *Melaleuca*. Trans. and Proc. Roy. Soc. South Australia 43: 368-372. Pl. 38. 1919.—Critical notes are recorded on *Melaleuca pustulata* Hook f., *M. halmaturorum*, and *M. pauperiflora* F. v. M.—J. H. Faull.

2243. COULTER, J. M. Tropical American plants. [Rev. of: BLAKE, S. F. (1) The genus *Homalium* in America (see Bot. Absts. 5, Entry 2370). (2) New South American spermatophytes collected by H. M. Curran (see Bot. Absts. 5, Entry 2371). Contrib. U. S. Nation. Herb. 20: 221-235, 237-245. 1919.] Bot. Gaz. 68: 488. 1919.

2244. COULTER, J. M. New species of *Vernonia*. [Rev. of: GLEASON, H. A. Taxonomic studies in *Vernonia* and related genera. Bull. Torrey Bot. Club 46: 235-252. 1919 (see Bot. Absts. 5, Entry 2381).] Bot. Gaz. 68: 488. 1919.

2245. COULTER, J. M. New names. [Rev. of: MACBRIDE, J. FRANCIS. (1) Notes on certain Leguminosae. (2) Reclassified or new spermatophytes. Contrib. Gray Herb. Harvard Univ. N. S., 59: 1-27, 28-39. 1919 (see Bot. Absts. 4, Entry 1743).] Bot. Gaz. 68: 488. 1919.

2246. COULTER, J. M. [Rev. of: (1) ROCK, J. F. The arborescent indigenous legumes of Hawaii. Hawaii Bd. Agric. and Forest. Bot. Bull. 5. 53 p., 18 pl. 1919 (see Bot. Absts. 4, Entry 1763). (2) ROCK, J. F. The Hawaiian genus *Kokia*. Hawaii Bd. Agric. and Forest. Bot. Bull. 6. 22 p., 7 pl. 1919 (see Bot. Absts. 4, Entry 1764). (3) KOIDZUMI, GENITI. Contributiones ad floram Asiae Orientalis. Bot. Mag. Tôkyô 33: 110-129. 1919 (see Bot. Absts. 4, Entry 1734).] Bot. Gaz. 68: 487. 1919.

2247. COULTER, J. M. New tropical American plants. [Rev. of: STANDLEY, P. C. Studies of tropical American phanerogams. Contrib. U. S. Nation. Herb. 20: 173-220. 1919 (see Bot. Absts. 5, Entry 2398).] Bot. Gaz. 68: 487. 1919.

2248. FERNALD, M. L. Brainerd and Peitersen's Blackberries of New England. [Rev. of: BRAINERD, EZRA, AND A. K. PEITERSEN. Blackberries of New England—their classification. Vermont Agric. Exp. Sta. Bull. 217. June, 1920 (see Bot. Absts. 8, Entry 233).] *Rhodora* 22: 185-191. 1920.

2249. HALL, HARVEY MONROE. *Chrysothamnus nauseosus* and its varieties. [Part I of: HALL, H. M., AND THOMAS HARPER GOODSPEED. A rubber plant survey of northwestern North America.] Univ. California Publ. Bot. 7: 159-181. Nov. 7, 1919.—The author undertakes to deal with the botanical relationships of the species of *Chrysothamnus* concerned. There is given a key to the sections of the genus and then one to the 22 varieties of *Chrysothamnus nauseosus* (Pall.) Britt. The new varieties and new combinations treated under the species are as follows: var. *hololeucus* (Gray), var. *latisquameus* (Gray), var. *salicifolius* (Rydb.), var. *gnaphalodes* (Greene), var. *speciosus* (Nutt.), var. *frigidus* (Greene), var. *plattensis* (Greene), var. *bernardinus*, var. *Bigelovii* (Gray), var. *glareosus* (M. E. Jones), var. *leiospermus* (Gray), var. *californicus* (Greene), var. *ceruminosus* (Dur. & Hilg.), var. *oreophilus* (A. Nels.), var. *pinifolius* (Greene), var. *consimilis* (Greene), var. *viridulus*, var. *mohavensis* (Greene), and var. *juncus* (Greene).—W. A. Setchell.

2250. JUMELLE, HENRI. Le Katoka, arbre a graines comestibles de Madagascar. [The katoka, a tree of Madagascar bearing edible seeds.] Compt. Rend. Acad. Sci. Paris 171: 924-926. 1920.—The katoka is the seed of a new species of *Treculia*, named *T. Perrieri* sp. nov. It is related to the jackfruit and breadfruit and is found in western Madagascar. A description of the plant is given.—C. H. Farr.

2251. KRÄNZLIN, FR. Beiträge zur Kenntnis der Gattung *Telipogon* HBK. [Contributions to a knowledge of the genus *Telipogon*.] Ann. Naturhist. Mus. Wien 33: 9-38. 1920.—There is a historical introduction to the account of this orchidaceous genus, a key to the 53 species, followed by descriptions of each. The following are described as new: *T. minutiflorus* (Costa Rica), *T. Sprucei* (Ecuador), *T. christobalensis* (Costa Rica), *T. Endresianum* (Costa Rica), *T. buenavistae* (Costa Rica), *T. buenaventurae* (Colombia), *T. Kalbreyerianus* (Colombia).—A. S. Hitchcock.

2252. MAIDEN, J. H. Notes on Tasmanian Eucalypts. Papers and Proc. Roy. Soc. Tasmania 1918: 82-90. 1919.

2253. RIDLEY, H. N. New Malayan plants. Jour. Botany 58: 147-149, 195-196. 1920.—The genera *Peripetasma* (Menispermaceae) and *Scaphocalyx* (Flacourtiaceae) are described as new, and the following new species are proposed: *Peripetasma polyanthum*, *Tinospora Curtisii*, *Scaphocalyx spathacea*, *S. parviflora*, and *Entada Schefferi*.—K. M. Wiegand.

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

B. E. LIVINGSTON, Editor

S. F. TRELEASE, Assistant Editor

2254. ANONYMOUS. Note. [Rev. of: SAUVAGEAU, CAMILLE. Utilisation des algues marines. [Utilization of marine algae.] Encyclopédie Scientifique: Bibliothèque de Botanique Appliquée. vi + 394 p. Octave Doin: Paris, 1920 (see Bot. Absts. 8, Entry 604).] Nature 106: 435. 1920.

2255. BARNARD, J. E. Microscopy with ultra-violet light. Nature 106: 378-381. 5 fig. 1920.—Description of apparatus used by author (essentially same as devised by KOHLER); illustrations of apparatus, photomicrographs of *Saccharomyces Pastorianus* and *Bacillus anthracis* by dark ground illumination compared with that by ultra-violet light.—O. A. Stevens.

2256. COTTERELL, K. W. Production of peat in 1919. Jour. Amer. Peat Soc. 14: 7-14. 1921.—The total production of peat in the United States in 1919 was 69,197 short tons, valued at \$705,532. The products from it were utilized as fertilizer and fertilizer filler, fuel, and as an ingredient of stock food. Carbonized peat is used for the latter purpose and it is not claimed to have "any particular nutritive value."—G. B. Rigg.

2257. CROSSLEY, A. W. Industrial research associations. III. The British Cotton Industry Research Association. *Nature* 106: 411-413. 1920.—Organization and outline of investigational work are described.—*O. A. Stevens.*

2258. F., H. B. The Bulawayo meeting of the South African Association. *Nature* 106: 388-389. 1920.—A review of the presidential address by I. B. POLE EVANS, "The Veld: its resources and dangers," and briefer notes of other botanical papers are presented.—*O. A. Stevens.*

2259. KAISER, GEORGE B. Little journeys into mossland. II. A February thaw. *Bryologist* 24: 5-6. 1921.—This is an informal account of a botanical ramble in search of mosses along Wissahickon Creek, Philadelphia.—*E. B. Chamberlain.*

2260. LAMBERT, F. La sericulture et les aveugles. [Silk culture and the blind.] *Ann. École Nation. Agric. Montpellier* 17: 105-119. *Fig. 1-10.* 1918 [1919].—It is shown that the greater part of the work pertaining to silk culture can be satisfactorily performed by blind persons.—*F. F. Halma.*

2261. MILLS, D. GORDON. The protection of wildflowers. *Jour. Bot. Soc. South Africa.* 6: 14-16. 1920.

2262. MYERS, J. L., AND H. H. TURNER. The British Association. *Nature* 106: 277-279. 1920.—A discussion of the place and management of meetings.—*O. A. Stevens.*

2263. PAMMEL, L. H. Some economic phases of botany. *Science* 53: 4-15. 1921.—In his address before Section G of the American Association for the Advancement of Science, Chicago, 1920, the writer reviews the work of earlier investigators and points out its bearing on the problems of the present and the future. The work is reviewed under the following headings: Plant pathology; pollination of flowers; plant breeding; seed studies; grasses; weeds; erosion; and aquatic farming. The plea is presented that botanists should enter more vigorously into the exploration of fields of agronomy, ecology, and taxonomy as they are related to agriculture and horticulture.—*A. H. Chivers.*

2264. STANFORD, R. V. The British Association. *Nature* 106: 279-280. 1920.—Discussion of place and management of meetings.—*O. A. Stevens.*

2265. STOELTZER, W. Ueber Alaunhämatoxylin. [Concerning alum haematoxylin.] *Centralbl. Allg. Pathol.* 30: 290-291. 1919.—The author describes the chemistry and staining properties of alum haematoxylin.—*E. C. Stakman.*

2266. WATERS, C. E. The society for the prevention of the wild. *Amer. Fern Jour.* 10: 115-119. 1920.—The article is a plea for the preservation of wild plants, especially of ferns.—*F. C. Anderson.*

2267. WOODS, A. F. The future of agricultural science in the American Association for the Advancement of Science. *Science* 53: 27-29. 1921.—While much has been accomplished in agricultural investigation in the past, what may rightly be termed the scientific phase of agricultural development is just being entered upon. If we are to feed and clothe the increasing population of the world and still retain some time for culture and recreation we shall need to conduct scientific research in all fields to an extent hitherto unknown.—*A. H. Chivers.*

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